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Annotated Bibliography on Medical Meteorology
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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY is a monthly publication devoted to:

A. Current Abstracts in English on important meteorological literature in every language.

B. Bibliographic references to other items of interest to the profession.

C. Selective, annotated bibliographies on subjects of immediate and special interest to meteorologists.

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 8 NOVEMBER, 1957 No. 11

SPECIAL FEATURE IN THIS ISSUE

Selective Annotated Bibliography on Medical Meteorology

By

Isadore Dordick and Geza Thuronyi

Prepared for

Air Pollution Medical Program, Division of Special Health Services, U. S. Public Health Service

(*For complete table of contents see back cover*)

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FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field and in related fields and to provide bibliographic information on various subjects, as interest demands.

Part I contains abstracts of current literature in the fields of meteorology, oceanography, etc., arranged according to the Universal Decimal Classification.

Part II of each issue comprises an annotated bibliography of important references on a special subject (usually arranged chronologically). No attempt is made to prepare exhaustive bibliographies; instead, the aim is to include a representative cross section of the various aspects of a subject.

Bibliographies published in the successive issues were:

Vol. I, 1950

1. Atmos. Pollution	2. Aerobiology	3. Cloud Physics	4. Hail
5. Tornadoes	6. Volcanic Dust	7. Climat. Changes	8. Thunderstorms
9. Icing	10. Acoust. Propagation	11. Evaporation	

Vol. II, 1951

1. Extended Forecast.	2. Long Range Forecast.	3. Soil Temp.	4. Constants, etc.
5. Clim. of Near East	6. Clim. of Middle East	7. Special Winds	8. Radar Storm Detect.
9. Condensation Trails	10. Clim. of N.E. Africa	11. Mountain Met.	

Vol. III, 1952

1. Clim. of N.W. Africa	2. Carbon Dioxide	3. Clim. of Argentina, etc.	4. Dew
5. Objective Forecast.	6. Stratus Forecast.	7. Urban Climatology	8. Clim. of C. Africa
9. Visibility	10. Glaze and Rime	11. Free Air Turbulence	

Vol. IV, 1953

1. Turbulence Theory	2. Turbulent Diffusion	3. Frost	4. Clim. of Australia, etc
5. High Level Winds	6. Winds in Stratosphere	7. Jet Stream	8. Radiation Bioclim.
9. Clim. of Pacific	10. Auroras	11. Sferics	

Vol. V, 1954

1. Oceanog. Met.	2. Clim. of S.E. Asia	3. Auroral Physics	4. Tropopause
5. Balloons	6. Numerical Forecast.	7. Radiation Data	8. Vertical Motion
9. Clim. of Arctic	10. Industrial Met.	11. Wind Waves and Swell	

Vol. VI, 1955

1. Bibliog. of Bibliog.	2. Texts & Monogr. Bibliogs.	3. Storm Surges
4. Ionospheric Prop.	5. Photochem.—Upper Atmos.	6. Cloud Physics
7. Radar Cloud Physics	8. Atmos. Nuclei (1841–1950)	9. Atmos. Nuclei (1951–1955)
10. Weather Modification	11. Cooling Power	

Vol. VII, 1956

1. Synoptic Met.-Arctic	2. Clim. of Enclosed Spaces	3. Cosmic Rays (–1952)
4. Cosmic Rays (1953–56)	5. Atmos. Radioactivity	6. Inversions
7. Snow Micromet.	8. Snow Micromet. (Suppl.)	9. Tropical Cyclones
10. Hurricane Damage	11. Tropical Cyclone Theory	

Vol. VIII, 1957

1. Solar Weather Relations	2. Night Airglow	3. Forecasting Special Elements
4. Forest Micrometeorology	5. Hydrometeorological Forecasting	6. Numerical Forecasting (Suppl.)
7. Albedo		
10. Tropospheric Propagation (1953–57)	8. Meteors	9. Tropospheric Propagation (–1952)
	11. Medical Meteorology	

Other bibliographies in preparation are:

Actinometers	*Ozone*	*Singularities*
High Atmosphere Temperatures	*Radio Astronomy*	*Sunspots and Solar Physics*
Microwave Propagation	*Radioactivity*	*Synoptic Aerology*

Part III contains a listing of reviews, translations, reprints, and the contents of important publications. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. The December issue comprises cumulative author, subject, geographical and journal indexes.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DN-HO:	U. S. Navy Hydrographic Office Library, Suitland, Md.
DNLM:	U. S. National Library of Medicine, Washington, D. C.
DSI:	Smithsonian Institution Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.
MH-BH:	Harvard University, Blue Hill Observatory Library, Milton, Mass.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by charts.

Geographic locations are in the English form rather than the form used locally, for example Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

Meteorologische Rundschau, 2(5/6):146–151, May/June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (Vol. 2), *Heft* 5/6 (No. 5/6), *pages* 146–151, May/June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

MAJOR GENERAL WORKS

TEXTBOOKS

8.11–1 551.510.5(02):551.521.4

Vassy, Étienne (*Prof. Faculty of Sciences, Paris*), **Physique de l atmosphère, tome I, Phénomènes d'émission dans l'atmosphère.** [Physics of the atmosphere, Vol. 1, Emission phenomena in the atmosphere.] Paris, Gauthier-Villars, **1956.** 338 p. numerous figs.—A most complete and up-to-date textbook, based on a lecture course given at the Faculty of Science in Paris. The **Introduction** covers in detail the methods of investigating the upper atmosphere, both direct and indirect (radiosonde, rockets, rockoons, etc.), structure, physics, chemistry, including latest data; (I) Aurora: history, forms, distribution, frequency, periodicity, spectroscopy, theory, application of results to study of upper atmosphere; (II) Night airglow: measurement, color, spectroscopy, polarization, time and space variations, correlation with other phenomena (ionosphere, geomagnetic, C.R.), origin, etc.); (III) Twilight emission phenomena: oxygen, sodium, nitrogen and their photoluminiscence; (IV) Meteor trail luminiscence: composition, spectra, mechanism of production, Öpik's theory, results with respect to upper atmospheric winds and structure; (V) Lightning and St. Elmo's fire, Sferics (observation, geographical distribution, structure, frequency, relation to meteorological situation). The work is full of illustrations of equipment, representative data, graphs, etc. The literature on each subject is thoroughly reviewed, but no bibliographic references or citations are included. The only other similar works are those by Mitra (*see* 4.8–15, Aug. 1953, *MAB*) and Khrgian (*see* 5.7–5, July 1954, *MAB*). *Subject Headings:* **1. Upper atmospheric physics 2. Emission phenomena 3. Luminiscence (Photoluminiscence) 4. Auroras 5. Textbooks.**—*M.R.*

8.11–2 551.509.33(02)

*§†Baur, Franz, **Physikalisch-statistische Regeln als Grundlagen für Wetter- und Witterungsvorhersagen.** [Physical-statistical rules as basis for forecasts for weather and weather character.] Vol. 1, pub. Frankfurt a.M., Akademische Verlagsgesellschaft MBH, **1956.** 138 p. 30 figs., 72 tables, bibliogs. (65 refs.), eqs. Foreword, table of contents, headings in text in German and English. **DWB** (MO9.3 B351 p). Review by J. M. Craddock in *Royal Meteorological Society, Quarterly Journal*, 83(355):136–137, Jan. **1957.** Review by F. Steinhauser in *Archiv für Meteorologie, Geophysik und Bioclimatologie, Ser. A.*, 9(4):529–531, **1957.** Review by Trenkle in *Die Umschau*, Frankfurt, a.M., 57(13):414, July 1, **1957. DLC**—This is the first of two volumes on the long range forecasting rules developed over the last 35 years by the well-known author and his "school." He starts with an attempted refutation of the common beliefs that weather cannot be forecast more than 36 hours in advance, that small impulses can cause great effects, or that a chance widespread snowfall early in winter would cause an unusually severe winter, whereas if it had been only 2 or 3° warmer and rained instead of snowed the winter would have been mild. The main connection which has been reportedly established is between solar phenomena and "grosswetter." The elaborate statistical support for the theses developed by the author is presented in a textbook type of work though giving more than a mere summation of factual knowledge. A critical evaluation of the statistical and physical bases for forecasting is interwoven with the practical presentation of the best techniques. Ch. I gives the statistical bases for forecasts in the daily weather service (the relations of the Azores High to weather in Europe, and forecasting prolonged dry and wet spells); II, large scale circulation relationships—jet stream—other special grosswetterlagen; III, the day-to-day zonal and meridional circulation and jet stream 1949–51; IV, solar relations (long period) with large scale weather features (with practical rules derived from statistical

studies) and relations with 500 mb zonal circulation—short period solar variations and weather. Colored correlation graphs of the grosswetter for the last 18 sunspot cycles (summer and winter) for Europe, Atlantic and Eastern U. S. are appended. *Subject Headings:* **1. Long range forecasting textbooks 2. Statistical bases for forecasting 3. General circulation studies.** —*M.R.*

8.11–3 551.46(02)

*Zhukovskiĭ, G. R., **Okeanografiia dlia sudovoditeleĭ.** [Oceanography for mariners.] Leningrad, Gos. Izd-vo Vodnogo Transporta, **1953.** 390+22 p. 227 figs., 82 tables+tables in appendix, maps (part fold.), bibliog. p. (409). **DLC** (GC11.Z47). Review by A. Rojecki in *Przeglad Meteorologiczny i Hydrologiczny*, Warsaw, 7(3/4):208–209, **1954. DLC**—A manual of oceanography compiled in accordance with the program of advanced merchant marine schools. It contains information on the distribution of oceans and continents, sea water temperature, salinity, specific gravity, density, transparency and color. The questions of sea ice, currents, swell and tidal movements, especially important for navigators, are discussed in great detail. A review of important practical and theoretical achievements of Russian navigators and scientists in the realm of oceanography and a discussion of the present organization of oceanographic studies in the U.S.S.R. are given in the introduction. The 11 chapters of the book deal successively with: general information on the world oceans; depths and relief; ocean bottom soils; composition and salinity of sea water; water temperature of oceans; specific gravity and density; acoustic and optical phenomena in the sea; sea ice; swell, sea and ocean levels; ocean currents. Numerous maps, charts, cross sections, schematic diagrams, tables and illustrations of equipment are included. *Subject Headings:* **1. Oceanography for mariners 2. Hydrography 3. Oceanography textbooks.**—*A.M.P.*

MONOGARPHS AND COMPREHENSIVE PAPERS

See also: **Turbulence effects on airplanes** (Eggleston), 8.11–73; **Local forecast studies** (Farnham, Gould), 8.11–150; **Lightning and lightning rods** (Strekel'nikov), 8.11–268

8.11–4 551.579.4

†Komarov, V. D., **Gidrologicheskiĭ analiz i prognoz vesennego polovod'ia ravninnykh rek.** [Hydrological analysis and forecasting of spring floods of rivers in plains.] Leningrad, Gidrometizdat, **1955.** 303 p. 166 figs., 27 tables, 150 refs., 74 eqs. **DWB** (M79.4 K81g)—Complete and systematic coverage of the methods used for forecasting spring floods in the plains of the U.S.S.R., considering snow melt, rainfall, radiation and synoptic conditions. Pt. I deals with snow cover and its characteristics for analysis and forecasting of spring floods; Pt. II, snow melt and methods of calculating it for a river basin; III, effect of soil conditions on snow melt; IV, effect of melt water on soil condition; V, water balance of river basins; VI, long range runoff forecasting for flood from water balance; VII, territorial runoff forecasting; VIII, forecasting peak runoff; IX, forecasting daily water discharge from snow melt data. Literature (Russian) is thoroughly reviewed and annotated. Albedo, radiation balance, water content of snow, effect of forests, ice; diurnal and seasonal effects—all are considered from an empirical as well as a theoretical standpoint. Nearly 200 nomograms and scatter diagrams and illustrative charts are included along with computation tables and extensive bibliography. *Subject Headings:* **1. Spring flood forecasting 2. Snow melt forecasts 3. U.S.S.R.**—*M.R.*

8.11–5 551.582.1(473) 551.589

§†*Blumenstock, David I. and Prozorowski, Olga Ph., **Synoptic climatology of the Moscow Basin.** [Their] Contract AF 19(604)-1004, [Unnumbered Report], April 30, **1956.** 2 vol. Vol. 1, Text. 123 p. Vol. 2, [illustrative material]. unpaged. 49 figs., 2 plates, 23 tables. —A brief discussion of the topography, hydrology, soils, vegetation, astronomical conditions and general climatic regime is followed by a more detailed one of mean circulation and air flow types of winter and of summer, based largely on work of LIR (1936) and POGOSIAN (1947); air masses and frontology (winter and summer), temperature regime at the surface and aloft, cold waves, heat waves, frost, clouds, precipitation, fog, snowstorms, drought, etc. are also

treated. In the appendices are found: I. Chubukov's local weather types for Moscow, II. Microclimatic studies in the area, and III. Surface and upper air data, charts, cross sections, soundings and numerous synoptic examples. All material used is carefully annotated and sources cited for data, charts, etc. *Subject Headings:* **1. Climate of Moscow Basin 2. Synoptic climatology 3. Moscow Basin, U.S.S.R.**—*M.R.*

8.11–6 551.573(419.6)

*Guerrini, V. H., **An analysis of evapotranspiration observations at Valentia Observatory Aug. 1952–July 1956.** *Eire. Meteorological Service, Technical Note*, No. 25, July **1957.** 20 p. 2 figs., 2 tables, 9 refs. **DWB, DLC**—Monthly values of PE observed at Valentia (1952–56) tabulated and compared graphically and in tables and on a regression chart with computed values, using the Penman and Thornthwaite formulas, respectively, and with runoff in the Shannon River. Appended are 5 and 10 day means of PE, maximum temp., wind speed, relative humidity, sunshine and daily mean temp., and monthly means of these elements and of vapor pressure, plus normals for 1921–50 for most elements. PENMAN's formula gives a better fit in winter—THORNTHWAITE's is not bad in summer. Advection of warm air in winter from Atlantic, when growth is at a standstill owing to little insolation is reason for poor fit of THORNTHWAITE's formula (based on temp.). Maximum temp. gives best correlation of parameters tested. *Subject Headings:* **1. Evapotranspiration 2. Valentia, Ireland.**—*M.R.*

8.11–7 551.583(481)

*Hesselberg, Th. and Birkeland, B. J., **The continuation of the secular variations of the climate of Norway 1940–50.** *Geofysiske Publikasjoner*, Oslo, 15(5), **1956.** 40 p. 10 figs., numerous tables. **DLC**—The authors published 4 monographs in the period from 1940–44 on the secular variations of the climate of Norway (up to 1940), covering temp. (*see* G–194, July 1950, *MAB*), precip., pressure and wind, and humidity, respectively. In this monograph the data for 1941–50 are treated in the same way to show the effect on the long period records of the several elements at various places for various seasons and for the year, of the 30-year running means for each year up to 1941–50. The effect of the 3 cold winters of 1940–42 is vividly shown in graphs and tables. Data for the various stations are given *in extenso* on p. 18–40. *Subject Headings:* **1. Climatic variations in Norway 2. Secular variations in climate 3. Norway.**—*M.R.*

8.11–8 551.556.2

Javadi, Shafi (*Prof. of Met. and Asst. Dean, Ahvaz College of Agri.*) and Banan, Gholam-Ali (*Former Prof. Forestry, Karaj College of Agri., Iran*), **Winds and wind-breaks.** *Iran, Ministry of Agriculture Publication*, **1955.** 111 p. Text and paging in Iranian. Cover page in English. photos, figs. (some with French or English legends), foot-refs. in French or English. **DWB** (M56.2 J41w)—An illustrated monograph discussing (in Iranian) all aspects of winds, wind measurements, wind utilization and wind protection for agricultural and other purposes; tornadoes, waterspouts, hurricanes, föhn winds, cyclonic storms, bora and special winds of all kinds, shelter belts in various countries, wind instruments (direct reading and recording), etc., etc. *Subject Headings:* **1. Wind instruments 2. Shelter belts 3. Winds 4. Iranian language.**—*M.R.*

8.11–9 550.543:525.6

Kertz, W., **Atmosphärische Gezeiten.** [Atmospheric tides.] *Handbuch de rPhysik*, Berlin, 48:928–981, **1957.** 19 figs., numerous foot-refs., bibliog. p. 978–981, 4 tables, 26 eqs. **DWB** (551.03 N236)—Atmospheric tides are distinguished from accompanying effects such as ionospheric dissociation and recombination, and cosmic ray and geomagnetic variations associated with solar periods. The gravitational force, radiation from sun and consequent planetary temperature wave and relationship between the two elements, influence of land and water distribution, equations of motion and their solution for a model atmosphere, effect of height and, finally, the actual pure solar and lunar semidiurnal, tri-diurnal, quarter diurnal and diurnal waves; effects of friction and mountain barriers, standing and free oscillations, the Taylor theories, etc., are treated in technical manner, both as to the theory and practical application. *Subject Headings:* **1. Atmospheric tides 2. Solar tides 3. Lunar tides.**—*M.R.*

8.11–10 551.510.5

†Minzner, Raymond A. and Ripley, W. S., **The ARDC Model Atmosphere 1956.** *U. S. Air Force Cambridge Research Center, Air Force Surveys in Geophysics*, No. 86, Dec. **1956.** 201 p. numerous figs., tables, eqs., 53 refs. **DWB, DLC**—A large monograph presenting the extensive tabular data to 542, 686 m or 1,850,810 ft and the technical details of the calculations which entered into the solution of values for the ARDC Model Atmosphere of 1956. This Model Atmosphere is subject to revision each year, if necessary, but conforms with the ICAO Standard atmosphere in the region from 5 to 20 km. The details of 15 atmospheric properties are treated. Both metric and English units are given in tables. Different methods of computation are critically discussed. The basic elements are: 1) molecular-scale temperature, 2) pressure and 3) density. Secondary properties treated are 4) scale height, 5) speed of sound, 6) air particle speed and 7) specific weight, 8) molecular weight, 9) molecular volume, 10) mean air density, 11) mean free path, 12) collision frequency, 13) real kinetic temperature, 14) coefficient of viscosity and 15) kinematic viscosity. This Model is to be used by all engineering and design work by or for ARDC. *Subject Headings:* **1. ARDC Model Atmosphere 2. ICAO Standard Atmosphere 3. Upper atmosphere properties. I. Sissenwine, N.**—*M.R.*

8.11–11 551.510.5

*U. S. Weather Bureau and U. S. Air Force. Geophysical Res. Directorate. [Joint] Committee on Extension to the Standard Atmosphere, **Extension to the Standard Atmosphere.** *American Meteorological Society, Bulletin*, 38(2):78–80, Feb. **1957.** fig., table. **DWB, DLC**—The ICAO extension of its Standard Atmosphere to 20 km has been adopted by 23 U. S. scientific and engineering organizations. A Tentative Atmosphere from 20–32 km and a Speculative Atmosphere from 75–300 km has also been included in the tables. These extensions may be changed by data obtained during the next 5 yrs. The adopted temperature curve to 300 km is given in degrees Kelvin. A table gives altitude in geometric and geopotential meters, temperature gradient, molecular scale temperature, kinetic temperature, molecular weight and pressure to 300 km. *Subject Headings:* **1. ICAO Standard Atmosphere 2. Tentative atmosphere 3. Speculative atmosphere 4. Upper air mean temperature. I. Wexler, Harry II. Sissenwine, Norman.**—*M.R.*

8.11–12 551.577.37:519.241.8(492)

†*Levert, C., **Regens: een statistische studie.** [Rains: a statistical study.] *Netherlands. Meteorologisch Instituut, Mededelingen en Verhandelingen*, No. 62, **1954.** 246 p. 67 figs., 143 tables, bibliog. p. 229–241. English summary p. 242–246. **DLC**—A magnificient monographic study of all aspects of rainfall intensities, durations, frequencies and related matters, from a statistical point of view. The international definitions of different types of rain (English, French, German and Dutch terms) are first discussed; next methods of measuring rainfall in Holland since 1897. In Ch. 3 the definitions used in this study are set forth, in Ch. 4 the many various types of data are presented for De Bilt (1926–48) in 72 separate tables and numerous graphs. Ch. 5 deals with intensities and durations which would prevent outdoor work; Ch. 7, with the % of annual rainfall attributed to the several types of rain; Ch. 8, with the computation of depth-duration frequencies; Ch. 9, with the daily amount and number of rains; Ch. 10, with number of rainy days; 11, with intense rains at scores of places in the Netherlands; 12, with frequencies, durations, etc. of heavy rains at Tilburg, Den Haag and other places in Holland; 13, with problems of evaluating recording raingage records and 14, with statistical lists of differences between recording and non-recording raingage amounts (daily); 15, with other computational errors in intensity-duration studies; 16, with the theory of extreme values applied to rainfall (GUMBEL, C. E. P. BROOKS, etc.); and 17, practical aspects such as rain-wind speed frequencies, snow, drop size distribution are discussed. In Ch. 18 a very extensive bibliography (by chapters) and a list of references cited are appended. *Subject Headings:* **1. Rainfall statistics 2. Rainfall in Netherlands 3. Statistical analysis of rainfall 4. Rainfall depth-duration frequencies 5. De Bilt, Netherlands 6. Netherlands.** —*M.R.*

8.11–13 551.576

*†Ludlam, F. H. and Mason, B. J., **The physics of clouds.** *Handbuch der Physik*, Berlin, 48:479–540, **1957.** 25 figs., 9 tables, 110 refs., 36 eqs. **DWB** (551.03 N236)—Cloud forms

and characteristics, condensation processes, nuclei (nature and origin distribution), growth of fog and cloud droplets by condensation and accretion, ice nuclei, spontaneous nucleation, supercooling and freezing, abundance of nuclei, artificial ice nuclei (AgI, NaI, KI, NH_4I, PbI_2, etc.), growth of ice crystals, formation of precip. (in layer clouds and Cu clouds, with and without ice crystals), hail growth, radar observations of structure, artificial stimulation of precip. (CO_2, AgI water drops), experimental seeding, large scale seeding, etc. are treated in a thorough manner in this comprehensive review article. Results in various countries are compared in tabular form. *Subject Headings:* **1. Cloud physics 2. Atmospheric nuclei.** —*M.R.*

ATLASES

8.11–14 551.576:12:061.3

International Cloud Atlas, Vol. 1 [Text]. (Geneva), World Meteorological Organization, **1956.** 155 p. figs., forms, foot-refs. **Historical bibliog. of cloud classification,** p. 137–139. **Bibliog. of cloud nomenclature,** p. 140–146. **DWB**—Vol. 1 gives historical information on cloud classification from Lamarck (1802) and Luke Howard (1803) to the present; appearances of clouds, classification (genera, species, varieties, accessory clouds and mother clouds), abbreviations and symbols; definitions, descriptions of general types, orographic influences, clouds as seen from aircraft (icing, turbulence, visibility, appearance and photography from above, fog and haze from aloft); special clouds (nacreous, noctilucent, from waterfalls, fires, volcanoes, industry and explosions); hydrometeors, lithometeors, photometeors and electrometeors and a description of each variety; observation of clouds and meteors; records, coding, etc., a chronological bibliography of cloud classification and one on cloud nomenclature, and a subject index. (For V. 2, *see* 8.8–35, Aug. 1957, *MAB.*) *Subject Headings:* **1. International Cloud Atlas 2. Cloud atlases 3. Cloud nomenclature. I. World Meteorological Organization.**—*M.R.*

8.11–15 551.576.12:061.3

International cloud atlas. Abridged ed. (Geneva), World Meteorological Organization, **1956.** 62 p. of text. 72 plates (42 in black and white; 30 in color). Also French language ed., **Atlas internationale des nuages.** 68 p. of text. 72 plates. . . . **DWB**—From the extensive text and over 200 cloud photographs in the 2 vol. edition of the International Cloud Atlas, the important instructions for identifying, observing and coding clouds, special clouds and meteors, plus a selection of 72 plates showing the most common types of clouds, etc. for use as a handy reference manual at observing stations all over the world have been included in this abridged edition. If more reference material or details are desired, the standard edition can be consulted. (*See* 8.11–14.) *Subject Headings:* **1. International cloud atlas 2. Abridged cloud atlas 3. Cloud codes. I. World Meteorological Organization.**—*M.R.*

8.11–16 551.515.2

§*U. S. Navy. Fleet Weather Central, Miami, Florida [**Annual report of hurricane season, 1956**]. Its *OPNAV Report*, 3140-9, issued **1957?** each section repaged. numerous charts (some fold.), tables, bibliog. (6 refs.) following Pt. 3. **DWB** (M15.2 U585as)—A complete report on issuance, verification and other details of hurricane forecasting by the U. S. Navy Fleet Weather Central at Miami during 1956, and a comparison of results of verification with the 1955 and 1954 seasons. Each individual hurricane from Anna on July 26 to Greta on Nov. 4–6 is analyzed, described and the synoptic (surface and upper level 700–200 mb) charts presented and discussed in connection with the warnings issued. Finally, the meteorological data collected during the tropical storms by the Airborne Early Warning Squadron Four during the 1956 season in the Atlantic, Caribbean and Gulf of Mexico are presented in charts and tables. *Subject Headings:* **1. Annual hurricane reports 2. Hurricanes, Caribbean (1956) 3. Hurricane warning verification.**—*M.R.*

8.11–17 551.594.221

Norinder, Harald, **Magnetic field variations of lightning strokes.** Uppsala. University. Institute of High Tension Research, Contract AF 61(504)-636-C, Technical Scientific Report,

No. 1, 1956? 51 p. 56 figs., 5 refs. **DWB** (M94.221 U69r)—Continuing the work begun in 1953 (after interruption caused by the 1939–45 war), the results of 1954–55 investigations of the nature of lightning discharges as determined from records of the magnetic field variations at 4 stations in the vicinity (of Uppsala) are outlined in some detail. Equipment, location of stations, methods, statistical survey of quasiperiodic variations, multiple strokes, simultaneous field variations at 2 stations, vertical vs. horizontal components, pre-discharge with no following-strokes or weak following-strokes, daylight photographs in relation to oscillograph records, magnetic field measured with loop antennas, and electric discharges from snow squalls and occlusions are reported. *Subject Headings:* **1. Magnetic field variations during lightning 2. Lightning field investigations 3. Uppsala, Sweden.**—*M.R.*

8.11–18 551.582.1(773)

*Moses, Harry E. and Willett, Jack H., **Five-year climatological summary July 1949–June 1954, Argonne National Laboratory, Du Page County, Illinois.** U. S. Argonne National Laboratory Contract W-31-109-eng-38, (Report) ANL-5592, 1956? 390 p. 21 figs., 348 tables. **DWB**—A voluminous compilation of frequency and average hourly data for 8 meteorological variables: wind, temperature, relative humidity, precipitation, solar radiation, atmospheric pressure, soil temperature (7 levels to 29 ft depth) and atmospheric stability (5.5 to 144 ft height). Location of equipment, specifications for tables, graphical wind roses, tables of combinations of elements, simultaneous histograms of various elements and, finally, a comparison of Chicago and Argonne temperature, relative humidity, pressure, wind and precipitation. Argonne Laboratory is in a rural environment 25 mi S.W. of Chicago and 14 mi S.W. of Midway Airport. *Subject Headings:* **1. Micrometeorological data compilations 2. Climate of Argonne National Laboratory 3. Soil temperature data 4. Tower data 5. Argonne National Laboratory, Lamont, Ill.**—*M.R.*

GENERAL GEOPHYSICS AND METEOROLOGY

IGY

See also: **Russian participation in IGY** (Sobolev), 8.11–33; **Canadian participation in IGY,** 8.11–45; **IGY ozone program** (Paetzold), 8.11–156.

8.11–19 550.3:061.3

Bartels, Julius, **Das Internationale Geophysikalische Jahr.** [The IGY.] *Wetterlotse*, No. 118:121–136, June **1957.** *Also:* **Und noch einmal: Das Internationale Geophysikalische Jahr.** [And again: The IGY.] *Ibid.*, 119:137–140, **1957. DLC**—Geophysics is defined as the natural physical processes of the earth, including the influence of the cosmos, especially the sun and moon. The IGY is concentrated on those geophysical phenomena which must be observed at the same time on a uniform plan over the whole earth. Solar phenomena and their influence on the ionosphere, aurora and cosmic rays will be investigated by American aircraft at as great heights as possible, by rockets and by artificial satellites. Author then turns to effect of changes of solar radiation on weather. The IGY will fill in gaps in our knowledge of radiation. The second article appeals for observations from ships, especially away from the main sea routes. *Subject Heading:* **1. International Geophysical Year, 1957–1958.** —*C.E.P.B.*

8.11–20 550.3:061.3

Nicolet, M., **The international Geophysical Year.** *Nature*, London, 180(4575):7–10, July 6, **1957.** 5 tables. **DWB**—Program of IGY is summarized. It consists of 14 "disciplines" considered under 3 groups, of which meteorology forms the second. There are >1600 meteorological stations and 2000 others. There are 60 National Committees. Arctic and Antarctic stations are listed. *Subject Heading:* **1. International Geophysical Year, 1957–1958.** —*C.E.P.B.*

8.11–21 551.594.5

†Vestine, E. H., **The aurora australis and related phenomena.** *American Geophysical Union, Geophysical Monograph,* No. 1:91–106, 1956. 14 figs., 2 tables, 55 refs. DLC—In this comprehensive review of the characteristics of the aurora australis, the author discusses the characteristics of auroral forms, the average daily frequency and average hourly frequency of occurrence of the aurora australis, the auroral spectrum and air flow, the relationships prevailing in solar and magnetic phenomena, electric current systems and auroras and the Antarctic aurora and airglow programs of the IGY during 1957–58. The article contains a table of auroral stations in the Southern Hemisphere over the period 1841–1940, photographs of auroras and numerous graphs and charts illustrating the subjects considered. *Subject Headings:* **1. Aurora australis 2. Auroral frequencies 3. Auroral-solar relationships 4. IGY auroral program.**—*I.L.D.*

8.11–22 539.16:550.3:061.3

Bolin, Bert, **Nuclear radiation measurements during the International Geophysical Year.** *Nature,* London, 180(4581):311–312, Aug. 17, **1957.** DWB—Natural and artificial radioactive elements throw much light on exchange processes in the oceans and atmosphere. A program of measurements during the IGY is recommended, including particulate airborne fission products at ground level, their deposition in precipitation and as dry deposits, and natural radioactivity of the air in the free atmosphere, tritium content of water, and determinations of C14 and tritium in the oceans. *Subject Headings:* **1. Radioactivity 2. IGY program.** —*C.E.P.B.*

WMO

8.11–23 551.58:061.3

Activities of the technical commissions. *World Meteorological Organization, WMO Bulletin,* 4(4):155–157, Oct. **1955.** DWB—Working groups of the commission for climatology have reported progress: 1) the group on Dynamic Climatology under A. H. GORDON and 2) that on Exchange of Historical Weather Data under W. C. JACOBS (based on replies from 55 countries to a questionnaire on data control procedures). Three more working groups were set up at the recommendation of the president of the CCl: a) climate and agriculture, b) climatic networkd and c) climatic summaries for aeronautical, marine and other purposes. Work of CMO, CMM and CSM working groups is also mentioned. *Subject Heading:* **1. WMO. Climatological Commission.**—*M.R.*

8.11–24 551.582.3

Ashford, O. M., **Climatic atlases.** *World Meteorological Organization, WMO Bulletin,* 6(2):69–70, April **1957.** DWB—Report of a meeting of experts at Centerton, N. J., Jan. 7–12, 1957, yo discuss draft specifications for the world climatic atlas and comments thereon from member countries. After revision of the draft, it was presented to CCl in Washington and again revised. It is now recommended that member countries and regional associations go ahead with planning and preparing national and regional atlases in accordance with these specifications. *Subject Headings:* **1. World climatic atlases 2. Climatic atlases.**—*M.R.*

8.11–25 551.58:061.3

Ashford, O. M., **Second Session of the Commission for Climatology.** *World Meteorological Organization, WMO Bulletin,* 6(2):59–62, April **1957.** photo. DWB—Notes on CCl meeting in Wash., D. C., Jan. 14–25, 1957, under C. W. THORNTHWAITE's presidency. At least 37 official delegates were present compared with 22 at the first session in 1953. Two working groups were established:—one on scientific or research aspects of climatology and hydrology under H. LANDSBERG (Committee B), and one on service aspects under C. C. BOUGHNER (Committee A). The latter worked up recommended changes for WMO Technical Regulations and a Guide to Climatological Practices. Committee B worked on specifications for a climatic atlas. CLIMAT messages and networks were also studied, and 6 scientific lectures (listed) were presented. Eight working groups were set up and R. G. VERYARD was elected president for the coming 4 years. *Subject Headings:* **1. WMO. Climatological Commission 2. Climatic atlases 3. CLIMAT broadcasts.**—*M.R.*

8.11–26 551.58:061.3

Veryard, R. G., **World Meteorological Organization Second Session of the Commission for Climatology, Washington, January 1957.** *Meteorological Magazine*, London, 86(1020):184–187, June **1957.** ref. **DWB**—C. W. THORNTHWAITE gave opening address on **The task ahead in climatology.** Resolutions related mainly to the establishment of 8 working groups. Recommendations embraced many aspects of climatology, including proposed amendments to WMO. Technical Regulations Report of Working Group on Climatic Atlases was commented on. R. G. VERYARD was elected new President. *Subject Heading:* **1. WMO. Climatological Commission.**—*C.E.P.B.*

ARCTIC RESEARCH

8.11–27 551.543.1(98)

Haurwitz, B. and Sépulveda, G. M., **The geographical distribution and seasonal variation of the semidiurnal pressure oscillation in high latitudes.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 10(1):29–42, **1957.** 2 figs., 4 tables, 15 refs., 8 eqs. English, German and French summaries p. 29–30. **DWB**—Data for 16 high-latitude stations (15 Arctic) were analyzed for 12-hr oscillation and the travelling wave and polar standing oscillation recalculated. For Greenland stations "disturbed days" were omitted. Amplitude varies little with latitude but shows an equinoctial maximum. There is no systematic dependence of phase on latitude. The wave is then separated into travelling and standing components (year only) and represented by vectors. In high latitudes $Z_2 = 9.6\, E_2(\theta) \sin(2t - 2\lambda + 289)$. *Subject Headings:* **1. Semidiurnal pressure waves 2. Arctic.**—*C.E.P.B.*

8.11–28 550.3:551.510.535

Colbert, L. O. (*Dir. Wash. Office, Arctic Inst. of N. A.*), **Geophysical research in Alaska.** *Arctic*, Montreal, 7(3/4):159–164, **1954.** fig. **DLC**—A description of the status of the geodetic network, of observations in the fields of gravity, geomagnetism, ionospheric studies and radio propagation and seismology in Alaska and an outline of future work in these fields in Alaska are presented. *Subject Headings:* **1. Geophysical research 2. Geomagnetism 3. Ionospheric research 4. Alaska.**—*I.L.D.*

8.11–29 551.506(268)

Van Der Bijl, W., **Meteorologische Waarnemingen bij de Noordpool, Pt. 1.** [Meteorological observations at the North Pole.] *Hemel en Dampkring*, 54(3):45–53, March **1956.** 2 figs., table. **DWB, DLC**—Expeditions to the North Pole from those of NANSEN to those carried on at the present time by the U. S., the Soviet Union, etc. to obtain meteorological data are reviewed. The 1954–55 expeditions to Ice Island "T-3" are described briefly especially with respect to their staffing and the meteorological data collected. The physical factors determining weather at the North Pole are summarized and monthly means of atmospheric temperatures and pressure for the period April 1954–Jan. 1956 are presented in a table and their significance is analyzed. This article is based upon the paper of H. K. MEYER, *Meteorologische Rundschau*, 8:35–39, and 117–122, **1955.** (*See* 7A–212 and 7A–222, Jan. 1956, *MAB.*) *Subject Headings:* **1. North Pole weather 2. Arctic expeditions 3. North Pole.**—*I.L.D.*

8.11–30 551.506.5(268)

Van Der Bijl, W., **Meteorologische Waarnemingen Bij de Noordpool, Pt. 2.** [Meteorological observations at the North Pole.] *Hemel en Dampkring*, Hague, 54(4):72–77, April **1956.** 7 tables, photo. **DLC**—Tables are given containing minimum and maximum and monthly mean temperatures obtained in the North Polar region by the "Fram" Expedition (1893–1896), the "Maud" Expedition (1922–1924), the Papanin expedition (1937) and by U. S. and Canadian expeditions during 1954–1956, monthly mean atmospheric pressures recorded by the same expeditions and mean temperature normals along each latitude (estimated by MOHN in 1900) and the normals of the Canadian stations Eureka (1941–50) and Isachsen (1948–1950). The coordinates of the point where the observations are made are given. Theoretical calculations and actual observations of lowest temperature are discussed. *Subject Headings:* **1. Expeditionary climatic data 2. Arctic air temperatures 3. North Pole weather 4. North Pole.**—*I.L.D.*

ANTARCTIC RESEARCH

See also: **Ocean currents, Antarctic** (Saint-Guily), 8.11–59.

8.11–31 551.506.5(99)

*Lepineux, Georges, **Les observations météorologiques de Pointe Géologie en Terre Adélie 66°40′S –140°01′E—altitude 14 m.: conditions atmosphériques en surface et en altitude du 18 février 1952 au 30 décembre 1952: relevés quotidiens et moyennes.** [Meteorological observations at Pointe Géologie in Adélie Land: atmospheric conditions at the surface and aloft, Feb. 18–Dec. 30, 1952: daily observations and means.] *Expéditions Polaires Françaises. Expéditions Antarctiques, Résultats Scientifiques, Ser. S.V. (Météorologie)*, [Unnumbered report], **1956.** 83 p. 8 figs. (incl. photos), numerous tables. **DWB**—Tables give 4 times daily surface (synoptic) observations, upper air winds to 12 km (201 pibals made from March 19, 1952 to Jan. 31, 1953; including twice daily observations in Dec. 1952), daily and monthly means of pressure and temperature at 3 hourly intervals for March–Dec. 1952, frequency of surface wind direction and speed by season, with Baillie type wind roses and a description and illustrations of the station, installations, etc. at Pt. Géologie in Petrel Island and Adélie Land to which the French base was moved after fire in Jan. 23, 1952 destroyed the station at Port-Martin, a few miles away. *Subject Headings:* **1. Expeditionary meteorological data 2. Upper air wind data 3. Expédition Polaires Françaises 4. Pointe Géologie, Adélie Land, Antarctica.**—*M.R.*

8.11–32 551.593.55

Mayaud, Pierre-Noël (*French Polar Exped.*) and Robley, R. (*Pic du Midi Observ.*), **L'émission crépusculaire du sodium dans l'hémisphère australe.** [Twilight emission of sodium in the Southern Hemisphere.] *Annales de Géophysique*, 10(3):258–261, July/Sept. **1954.** 3 figs., 2 tables, ref. French and English summaries p. 258. **MH-BH**—Suspects a seasonal variation of the D-line similar to that found in the Northern Hemisphere but opposite in phase. Some observational results with a microphotogram and variation of crepuscular emission with time are presented. *Subject Headings:* **1. Crepuscular emission 2. Sodium D-line emission 3. Adélie Land, Antarctica.**—*A.A.*

8.11–33 551.5:550.3:061.3

Sobolev, L. G., **Meteorologicheskie issledovaniia v Antarktike.** [Meteorological research in the Antarctic.] *Meteorologiia i Gidrologiia*, Leningrad, No. 1:60–61, Jan. **1956. DWB, DLC**—The Soviet program of meteorological research in Antarctica in connection with the IGY is described. This includes weather studies, aerological research, energy balance at the earth's surface, etc. Soviet institutions participating in the program and the names of individual participants are mentioned. *Subject Headings:* **1. Russian participation in IGY 2. Meteorological research 3. U.S.S.R.**—*I.L.D.*

SERVICES

See: **Airline met. services** (Schreiber), 8.11–77; **Ind. weather services** (Collins), 8.11–101; **Weather serv. for operation of railroads, Austria** (Liebsch), 8.11–107.

SOCIETIES AND INSTITUTIONS

See also: **Italian Geophys. Inst.**, 8.11–36.

8.11–34 551.5:061.6(439.1)(04)

Dési, Frigyes, **A magyar meteorológiai kutatás időszerű feladatai.** [Current tasks of meteorological research in Hungary.] *Időjárás*, Budapest, 60(4):201–206, July/Aug. **1956.** Russian and English summaries p. 201. **DLC**—In this opening address to a Hungarian Meteorological Society meeting, the author stresses (in the spirit of the 20th Communist Party Congress in Moscow) the importance of cooperation in scientific research. Problems of cooperation between meteorologists and those working in other fields such as agriculture, medicine, forestry, hydrology, geography and mathematics, are discussed: several instances of such cooperation or lack of it (in Hungary) are mentioned. In the field of coordination of synoptic and climatological research the need for the use of electronic computers is stated.

Finally, Hungary's participation in international meteorological activities is outlined (next meeting of the WMO Regional Commission for Europe to be held at Budapest; foreign scientists on the editorial staff of "Időjárás"; and the Hungarian IGY program). *Subject Headings:* **1. Meteorological research cooperation 2. Hungary 3. Addresses.**—*G.T.*

OBSERVATORIES

8.11–35 551.501.9

Kirigin, B., **Visinska meteorološka stanica Zavižan (1620 m).** [The Zavižan meteorological mountain station (1620 m).] *Yugoslavia. Hidrometeorološka Služba, Vesnik*, 5(1/2): 31–34, Jan./June **1956.** 2 figs., table, 2 refs. **DWB**—Instruments used and measurements made at the Zavižan mountain station are briefly specified. The station was established in 1953 and has been rated as a 2nd order station since Jan. 1, 1956. The instrumentation includes a wind recorder, Campbell-Stokes heliograph, snow stakes, precipitation gages (several types are being compared), a gage adapted to measure fog deposits (by means of GRUNOW's technique), a barometer and a barograph. Establishment of a laboratory for investigating the mechanics and crystalline structure of snow is being considered. *Subject Headings:* **1. Mountain meteorological stations 2. Meteorological instruments 3. Zavižan, Yugoslavia.** —*G.T.*

8.11–36 550.3

†Rome. Istituto Nazionale di Geofisica, **Istituto Nazionale di Geofisica.** [National Institute of Geophysics.] Rome, **1954.** 86 p. numerous figs. and photos, 290 refs. **DLC**—A collection of excellent photographs and information on the geophysical observatories (several in high mountains) and activities in these observatories and in laboratories at many places in Italy, Sicily and Sardinia. Special attention is given to the National Geophysical Institute in Rome and the seismic, meteorological, geodetic and related work done there. The purpose of the publication is to give geophysicists and others attending the IUGG meeting in Rome (Sept. 1954) an idea of the quality of equipment and scope of the work done in Italy. *Subject Headings:* **1. Geophysical observatories 2. Italian Geophysical Institute.**—*M.R.*

8.11–37 551.501.9:551.594.7:061.6

Smith-Rose, R. L., **The new Radio Research Station, Ditton Park, Slough.** *Nature*, London, 180(4578):163–166, July 27, **1957. DWB**—New permanent buildings of Radio Research Station were opened by SIR EDWARD APPLETON on June 20, 1957. Radio research in the past 35 years summarized and present program set out, especially in connection with IGY. *Subject Headings:* **1. Radio observatories 2. Radio Research Station, Slough, Eng.** —*C.E.P.B.*

CONFERENCES AND SYMPOSIA

See also: **WMO. Climat Comm., 2nd session** (Ashford), 8.11–25; **Conf. on evap. from cultivated fields** (Tsuberbiller), 8.11–208.

8.11–38 551.585.53(08)

Monteith, J. L., **Climatology in arid zone research.** *Weather*, 12(7):203–210, July **1957.** 2 photos. **DWB**—Account of symposium at Canberra, 17–20 Oct. 1956. Rainfall in central Australia is only about 5" a year, but plants extract water from soil moisture by day. Animals show special adaptations. Measurements of evaporation by gradients of humidity and wind, changes of soil moisture or lysimeter tanks, and estimation from climatic data are discussed. Rainfall may be increased and evaporation diminished (by a film of cetyl alcohol). Screen temperatures are an unreliable index of heat stress. Radiation dominates heat balance. Influence of short-wave radiation is complex. *Subject Headings:* **1. Desert climatology 2. Arid zone research 3. Symposia.**—*C.E.P.B.*

8.11–39 621.396.8:522(08)

Westerhout, G., **Het Radioastronomische Symposium in Jodrell Bank.** [Radio Astronomy Symposium at Jodrell Bank.] *Hemel en Dampkring*, The Hague, 54(1):4–13,

Jan. 1956. **DWB, DLC**—An account of the results of astronomic research carried out with radiotelescopes: studies on the 21 cm line in the vicinity of Orion, heavy water in the universe and absorption of radio sources by hydrogen clouds. The supernova Cassiopeia A, the possible existence of a radio galactic system, and the limit of the universe are summarized. Photographs of radiotelescope installations, of hydrogen clouds around the Orion association, of the first radio astronomy star map etc. are included. *Subject Headings:* **1. Radio astronomy symposia 2. Radiotelescopes 3. Symposia.**—*I.L.D.*

EDUCATION, HISTORY AND BIOGRAPHY

BIOGRAPHY

8.11–40 551.510.42:92

Bailey, Maurice H., **A Birmingham clean air pioneer. The influence of John Cadbury.** *Smokeless Air*, No. 102:260–262, Summer 1957. photo. **DWB**—In 1828 powers were obtained to deal with smoke emitted by steam engines, but little was done until in 1843 CADBURY joined the Steam Engine Committee and introduced a method of reducing smoke. In 1844 an Inspector was appointed. By 1851 the number of bad chimneys had been reduced from 176 to 55. *Subject Headings:* **1. Biography 2. Cadbury, J.**—*C.E.P.B.*

8.11–41 551.5:92

Birot, Pierre, **Emmanuel de Martonne (Obituary).** *Societa Geografica Italiana, Bollettino*, Ser. 8, 9(1/3):1–3, Jan./March **1956. DWB, DLC**—Born at Chabris, India in 1873, died at Paris July 24, 1955, founder of the French school of physical geography (based on W. M. DAVIS' school). His first monograph on geography came out in 1902, his famous **Traité de géographie physique** in 1909, and his work on arid zones begun in 1913 and continued in his famous Climatic Classification (1928–31) or Aridity Index, continued until 1947. He was also a great teacher. Also: Gottmann, Jean, **Obituary of Emmanuel de Martonne.** *Geographical Review*, N. Y., 46(2):277–279, April **1956. DWB, DLC**—The author reviews the academic and scientific career of EMMANUEL DE MARTONNE and lists some of his major contributions to geography; his work on aridity is stressed especially. *Subject Headings:* **1. Obituaries 2. de Martonne, Emmanuel.**—*M.R., I.L.D.*

8.11–42 551.5:92

Gruber, Howard and Gruber, Valmai, **Hermann von Helmholtz: Nineteenth-Century polymorph.** *Scientific Monthly*, Wash., D. C., 83(2):92–99, Aug. **1956.** 3 figs., 13 refs. **DLC**—An unusually interesting account of the life of one of the great "universalists" and empiricists of the 19th century. Helmholtz wrote >200 articles and books on medical physics, optics, hydrodynamics, meteorology, acoustics, philosophy, psychology, physiology, etc. He invented many optical and acoustical instruments and measured many difficult quantities such as the velocity of a nerve impulse or heat of muscular contraction. He did not worry about the boundaries between disciplines—measurements of heat generated by muscular action led to his discovery at the age of 26 of the law of conservation of energy (1847). Color vision studies led to non-Euclidean mathematics; he studied sound, hearing, vortex motion, hydro- and electro-dynamics. Born in Potsdam in 1821, visited Chicago in 1893, died in 1894. Descendant of WILLIAM PENN. *Subject Headings:* **1. Biography of Hermann von Helmholtz 2. von Helmholtz, Hermann.**—*M.R.*

8.11–43 551.5:539:92

Fleischmann, R., **Walter Bothe und sein Beitrag zur Atomkernforschung.** [Walter Bothe and his contribution to atomic nuclei investigation.] *Naturwissenschaften*, 44(17):457–460, Sept. 1, **1957.** 11 refs. **DWB**—BOTHE was born Jan. 8, 1891 at Oranienburg, died Feb. 10, 1957 at Heidelberg. In 1920 he joined the Physical-technical Reichsinstitut and worked in the radioactivity laboratory under H. GEIGER on scatter processes of electrons, including observations with cloud chambers and Geiger counters. He became head of radioactivity department in 1925. In 1929 he showed that cosmic radiation was corpuscular, and since then has investigated secondary effects, mostly by coincidence method. He then turned to

artificial nuclear changes by γ-radiation. In 1930 he went to Giessen and in 1932 to Heidelberg. During the war he worked on uranium and in 1943 completed a cyclotron. After the war he returned to the Max-Planck Institute and worked on γ spectroscopy and cosmic radiation. *Subject Headings:* **1. Obituaries 2. Bothe, W.**—*C.E.P.B.*

HISTORY

8.11–44 551.506:902

Seyfert, Franz, **Klimatologische und phänologische Daten aus der "Chronik der Stadt Hammelburg."** [Climatological and phenological data from the "Chronicle of the town of Hammelburg."] *Angewandte Meteorologie*, 2(12):381–386, May **1957. DLC**—List of cold winters 994–1698/99, winter thunder, late snowfall, hot and dry summers, cold and wet summers, etc., and a few phenological observations, collected by H. Ullrich. *Subject Headings:* **1. Historic weather records 2. Ullrich, H.**—*C.E.P.B.*

BIBLIOGRAPHY

8.11–45 550.3:016

†**Canadian Geophysical Bulletin,** Ottawa, Vol. 8-9, pub. Dec. **1955,** Dec. **1956.** 2 pieces each about 60 p. bibliog. at end of each section. map. **DLC**—In each volume a report on each phase of geophysical research in Canada (incl. meteorology, oceanography, seismology, geodesy, hydrology, terrestrial magnetism) is followed by a bibliography of publications in the respective fields. The bibliographies are quite extensive, and cover a wide range of research, some of it in anticipation of IGY activities in Canada (plans for which are reviewed for each field in Vol. 8). Many of the references contain author's abstracts. *Subject Headings:* **1. Geophysical bibliographies 2. Meteorological research in Canada 3. Canada.**—*M.R.*

8.11–46 025.354

Kistermann, Fr. and Ühlein, E., **Die Sichtlochkarte. Vereinfachte Auswertung von Literatur und Untersuchungsergebnissen.** [The visual punched card. Simplified evaluation of literature and investigation results.] *Umschau*, 57(12):370–371, June 15, **1957.** 3 figs. **DLC**—Describes a visual method of selecting from a limited number of punched cards, similar to "Peekaboo" in U. S. *Subject Heading:* **1. Punched card methods.**—*C.E.P.B.*

TERMINOLOGY

See also: **Statistical vocabulary,** 8.11–119.

8.11–47 551.50:001.4

Beelitz, Paul, **Die Modifikation des Begriffs Aerologie.** [Modification of the concept of aerology.] *Zeitschrift für Meteorologie*, 10(12):373–380, Dec. **1956.** 23 refs. **DLC**—Derivation of aerology is traced back to Greek for the lower atmosphere. The term was first used scientifically in 1906 for the study of the free atmosphere, but after 1941 dropped out of use. A second meaning covered "synoptic aerology" (Scherhag, 1948). A third was more general—vertical study of the atmosphere above 2 km by optical, acoustical and electrical methods, balloons, kites, aricraft and rockets. *Subject Headings:* **1. Aerology definitions.** —*C.E.P.B.*

8.11–48 551.5:517.512.2

Dewey, Edward R. (*Dir., Foundation for the Study of Cycles, N. Y.*), **Cycle analysis as a tool for hydrologic research.** (In: **Pennsylvania Electric Association. Hydraulic Power Committee, Symposium on climatic trends in northeastern United States, April 22–23, 1952, Minutes, 1952.** p. 96–102. **Discussion.** *Ibid.*, p. 103–106.) **DWB**—In presenting a score of slides showing cycles and rhythms in economic and biological factors, the speaker points out that *cycles* need not be regular, and rhythms need not be *absolutely* regular, whereas periodicities must be regularly recurrent. Most events which report themselves in nature are rhythmic. Random numbers may be cycles since some are bound to be larger than others, but these cycles are not predictable. Weather cycles are the most complex of all since there are so many superimposed rhythms and they tend to conflict with each other. No climatic

or hydrologic cycles have been tested by the author. *Subject Headings:* **1. Cycles 2. Harmonic analysis.**—*M.R.*

APPLIED METEOROLOGY

MARINE METEOROLOGY AND OCEANOGRAPHY

See also: **Oceanog. for mariners** (Zhukovskiĭ), 8.11–3; **Radiocarbon in ocean** (Arnold), 8.11–266.

8.11–49 551.546(09)

†Bruns, Erich, **Die Entwicklung und die neuesten Fortschritte auf dem Gebiet der Meereskunde in der Sowjetunion, Erster Teil.** [Development and recent advances in the field of oceanography in the Soviet Union, Pt. 1.] *Akademie der Wissenschaften zu Berlin, Wissenschaftliche Annalen*, 5(10):775–796, Oct. **1956.** 10 figs. (incl. photos), table, 21 refs. **Pt. 2,** *Ibid.*, 5(11):894–910, Nov. **1956.** refs. **DWB, DLC**—Pt. 1, gives a long detailed summary of recent (since 1919) investigations in the field of oceanography, hydrography and ice study in the Soviet Union and neighboring seas. The work on the floating ice islands of the Arctic (fall of the 1955) and their equipment is described and illustrated. A list of important Soviet periodicals and serials (in German translation) is included. Many of these contain meteorological as well as oceanographic material, and much of the research reported is meteorological or partially so. In Pt. 2, the author presents a detailed analysis chapter by chapter of Shuleĭkin's monumental work **Physics of the seas** (*see* 6.2–2, Feb. 1955, *MAB*). It is a comprehensive exposition of Shuleĭkin's ideas on and theoretical approach to physical oceanography. This is followed by a description of Vol. 2 of the **Marine atlas** published in 1953 in the U.S.S.R. It consists of four parts, namely: oceanographic voyages and expeditions, oceanography, climate and terrestrial magnetism, cartography and astronomy. An extensive bibliography on Soviet oceanography is appended. *Subject Headings:* **1. Progress in oceanography 2. Oceanographic periodicals 3. Oceanographic research 4. U.S.S.R.**—*M.R., I.L.D.*

8.11–50 551.46

†Dietrich, Gunter, **Beitrag zu einer vergleichenden Ozeanographie des Weltmeeres.** [Contribution to a comparative oceanography of the oceans.] *Kieler Meeresforschungen*, Kiel, 12(1):3–24, **1956.** 5 figs., 68 refs. **DWB**—A comprehensive regional classification of the oceans is given and the salinity, temperature and structural characteristics of each zone discussed and illustrated by means of cross sections. The basis for the classification is the general wind-current regime, e.g., trade wind current (P), equatorial current (A), monsoon current (M), horse latitudes (R), jet stream (F), westwind drift (W) and polar (B). Each type has 1 to 3 subtypes designated by a small *a* if equatorially directed, *w* if zonal (west wind), *p* for polewards, *I* for ice covered (Arctic pack ice), etc. A chart shows regions and subregions. *Subject Headings:* **1. Oceanographic classification schemes 2. Comparative oceanography 3. Ocean currents 4. Wind driven currents.**—*M.R.*

8.11–51 532.59:551.46

*Roll, Hans Ullrich (*German Weather Service*), **Höhe, Länge und Steilheit der Meereswellen im Nordatlantik. Statistik der Wellenbeobachtungen der Ozean-Wetterschiffe.** [Height, length and depth of ocean waves in the North Atlantic. Statistics of wave observations by ocean weatherships.] *Hamburg. Seewetteramt, Eizelveröffentlichungen*, No. 1, **1953.** 58 p. table, diagr., numerous charts. **DWB**—Radio messages sent from Nov. 1950 to Oct. 1952 from weatherships were used to derive some statistical conclusions about frequency distributions of wave characteristics. The resulting data are presented in detail by ships, seasons and directions. Special attention is paid to storm and hurricane waves. *Subject Headings:* **1. Ocean waves 2. Storm surges 3. Ocean weather stations 4. North Atlantic.**—*A.A.*

8.11–52 532.59:551.46

Roll, H.-U., **Die Meereswellen in der südlichen Nordsee: (auf Grund von Wellenbeobachtungen deutscher Feuerschiffe.)** [Sea waves in the southern North Sea: based on

wave observations made on German lightships.] *Hamburg. Seewetteramt, Einzelveröffentlichungen*, No. 8, **1956.** 63 p. mostly figs. and graphs. **DLC**—This very detailed graphical and numerical representation of wave statistics gives frequency for height and periods and waves, their annual course, slope of waves, relation of wave height and period to wind speed, depending also on wind direction. Combined wind frequency diagrams are given for each lightship. *Subject Headings:* **1. Ocean wave statistics 2. Lightship observations 3. North Sea.**—*A.A.*

8.11–53 551.515:551.461.2

Charnock, H. and Crease, J., **North Sea surges.** *Science Progress*, London, 45(179):494–511, July **1957.** 5 figs., table, 42 refs., 7 eqs. **DWB**—Progression of a surge (Jan. 6–10, 1949) at the rate of the diurnal tide, counter-clockwise round the North Sea, is illustrated. Forecasting surges from meteorological data is described. Theoretical work (equations of motion and continuity for oceans) is outlined. Height of surges in estuaries is discussed. Numerical computation of storm surges is illustrated. *Subject Headings:* **1. Storm surges 2. North Sea.** —*C.E.P.B.*

8.11–54 550.9:539.16:546.26:546.264

Craig, Harmon (*Scripps Inst. of Oceanog., Univ. of Calif., La Jolla, Calif.*), **The natural distribution of radiocarbon and the exchange time of carbon dioxide between atmosphere and sea.** *Tellus*, Stockholm, 9(1):1–17, Feb. **1957.** fig., table, 24 refs., 21 eqs. **DLC**—Steady-state equations governing the transfer and distribution of a radioactive isotope between its various exchange reservoirs are applied to the natural distribution of carbon 14. The radiocarbon enrichment or depletion in each reservoir, relative to the hypothetical state in which mixing is infinitely faster than the decay rate, is evaluated as a quantitative function of the exchange rates between the reservoirs. From the observed distribution of C^{12}, C^{13}, and C^{14} in the atmosphere, biosphere, and sea, and from the estimated production rate of C^{14} by cosmic rays, the residence time of a carbon dioxide molecule in the atmosphere, before entering the sea, is found to be between four and ten years. The atmospheric residence time may also be evaluated, independently of the estimated C^{14} production rate, by considering the functional dependence of the C^{14} concentration in the oceanic mixed layer on the residence times in the atmosphere and the deep sea. This second method of evaluation also leads to an atmospheric residence time of about seven years. The average annual exchange flux of carbon dioxide into the sea is thus about 2×10^{-3} mole per square centimeter of sea surface. The average residence time of carbon dioxide in the deep sea is estimated as probably not more than about 500 years. *Subject Headings:* **1. Radiocarbon distribution 2. Radiocarbon concentration 3. Radiocarbon dating 4. Ocean-atmosphere carbon dioxide exchange.**—*Author's abstract.*

8.11–55 551.463:535.24

Kampa, Elizabeth M. (*Scripps Institution of Ocean., Univ. of Calif., La Jolla, Calif.*), **A discrepancy between calculation and measurement of submarine illumination.** *National Academy of Sciences, Wash., D. C., Proceedings*, 41(11):938–939, Nov. 15, **1955.** fig., 5 refs. **DWB**—At a depth of 350 m in the San Diego trough, it was found that the measured illumination (using multiplier phototubes) at noon may differ from the calculated values by as much as 5 orders of magnitude. This is due to the fact that extrapolation from the optically dense surface (100 m deep) layer is not warranted because there is a clear layer below 100 m, having greater penetrability than the surface. However, at the top of the sonic scattering layer (ca 350 m) there is another discontinuity—the rate of depletion again paralleling that in the surface layers although indications are that the water below that depth is as clear as above 350 m. *Subject Headings:* **1. Submarine illumination 2. Sonic scattering layer 3. San Diego trough, Pacific Ocean.**—*M.R.*

8.11–56 551.463:535.24

Waterman, Talbot H. (*Dept. of Zoology, Yale Univ.*) and Westell, William E. (*Bermuda Biol. Station, St. George's*), **Quantitative effect of the sun's position on submarine light polarization.** *Journal of Marine Research*, New Haven, Conn., 15(2):149–169, Nov. **1956.** 12 figs.,

16 refs. **DWB, DLC**—Results of over 1000 measurements of the degree and plane of submarine light polarization at depths of 3 to 41 m at 20 littoral stations in or near St. Thomas, Virgin Islands and at 15 stations in Bermuda. Two special polarimetric devices—one an interference analyzer and the other an underwater polarimeter are described and their use and resulting data presented. Many curves show relation of sun's altitude or bearing on underwater light or on submarine polarization plane. The light was found to be polarized, at varying degrees, from 5–500. Extinction coefficients range from 0.05 in clear to 0.185 in turbid water. Type of bottom also affects reflection and hence extinction of illumination. Other factors are discussed and illustrated. *Subject Headings:* **1. Submarine light polarization 2. Submarine illumination 3. Bermuda 4. Virgin Islands.**—*M.R.*

8.11–57 551.464(265/266)

Muromtsev, A. M., **Novaia karta raspredeleniia solenosti na poverkhnosti severnoĭ chasti Tikhogo okeana.** [A new surface salinity map of the Northern Pacific Ocean.] *Meteorologiia i Gidrologiia*, No. 6:36–38, June **1956.** map, graph. **DWB, DLC**—The author discusses the factors determining the salinity of the ocean surface, the annual variation of salinity in the southern Kuril region (shown on a graph) and the basis and characteristics of Schatl's map of the salinity of the Pacific Ocean. The construction of a new chart of the salinity of the Pacific Ocean based on extensive data of the Oceanographic Institute is described and a map and isolines of the distribution of salinity at the surface of the Northern Pacific is presented. *Subject Headings:* **1. Salinity maps 2. Annual salinity variations 3. Salinity distribution 4. Northern Pacific Ocean.**—*I.L.D.*

8.11–58 551.465

Neumann, Gerhard (*Dept. of Met. and Oceanog., New York Univ.*), **Notes on the horizontal circulation of ocean currents.** *American Meteorological Society, Bulletin*, 37(3):96–100, March **1956.** 3 figs., 5 refs., 4 eqs. **DWB**—In examining the question as to why ocean currents are not everywhere strongest in the west, if the variation of the Coriolis parameter with latitude is the only cause producing this asymmetry, the author discusses with the aid of a model, the effect of a variable depth of the wind driven oceanic circulation on the steady state current system. There is much evidence that in the Atlantic Ocean the depth of the layer of no motion increases poleward proportionally to the geographic latitude in both hemispheres. It seems that the oceans react to the planetary vorticity effect in such a way that they tend rather to adjust the level of the motion than to displace the gyre of the wind driven circulation to the west. *Subject Headings:* **1. Oceanic circulation 2. Ocean currents.**—*Based on author's abstract.*

8.11–59 551.465

Saint-Guily, Bernard (*Inst. Oceanographique*), **Sur la théorie des courants marins induits par le vent.** [On the theory of marine currents induced by the wind.] *France. Comité Central d'Océanographie et d'Étude des Côtes, Bulletin d'Information*, 8(3):111–123, March **1956.** 12 figs., 21 eqs. **DLC.** Short version in *Académie des Sciences, Paris, Comptes Rendus*, 242(3):403–405, Jan. 16, **1956.** ref., 9 eqs. **DLC**—Theoretical aspects are outlined for a circular water body with constant depth, as well as for the meridional and zonal circulation in limited oceans. Results are compared with actual sea level observations. The westward intensification of currents is explained. A theoretical model of the Antarctic Ocean is analyzed and the upwelling of cold depth waters is explained. The effect of characteristic parameters on the computed circulation scheme is shown. *Subject Headings:* **1. Ocean currents 2. Hydrodynamics 3. Antarctic Ocean.**—*A.A.*

8.11–60 551.465(263)

Swallow, J. C. and Worthington, L. V., **Measurements of deep currents in the western North Atlantic.** *Nature*, London, 179(4571):1183–1184, June 8, **1957.** 7 refs. **DWB**—An area off Cape Romain, S. Carolina (33°N, 75½–76°W) was investigated by 9 floats. Three at 2500 m depth moved between S. and S.W. at 2.6–9.5 cm/sec, and 4 at 2800 m moved S. at 9.7–17.4 cm/sec. Level of no motion is probably between 1500 and 2000 m. *Subject Headings:* **1. Deep ocean currents 2. Gulf Stream.**—*C.E.P.B.*

GLACIOLOGY AND ICE

8.11–61 543:546.21:551.311.12

Coachman, L. K.; Hemmingsen, E. and Scholander, P. F., **Gas enclosures in a temperate glacier.** *Tellus*, Stockholm, 8(4):415–423, Nov. 1956. 6 figs., table, 16 refs., eqs. **DLC**—Techniques are described for separating gas from glacier ice and analyzing for oxygen, nitrogen and carbon dioxide. A systematic survey of a temperate glacier (Storbreen, in the Jotunheimen District, Norway, in March) for enclosed gas showed: 1) no general loss of gas from the glacier, but a specific loss of oxygen from the gas from the upper to the lower part of the glacier, and 2) the gas pressure and ice density increased from the upper to the lower part of the glacier. Present evidence indicates that a chemical reduction is responsible for the oxygen loss. The various data are discussed in relation to glacier mechanics. *Subject Headings:* **1. Gases in glaciers 2. Storbreen Glacier, Norway.**—*Authors' abstract.*

8.11–62 551.513.1:551.311.12

Wallén, Carl C., **Recent variations in the general circulation as related to glacier retreat in northern Scandinavia.** *Geofisica Pura e Applicata*, 18:175–178, 1950. 10 refs. **DLC**—The author cautions against ambiguous use of the term "increased general circulation" which has been used by some authors in accounting for glacier retreat in Scandinavia. He demonstrates that increased westerly flow into Northern Europe would give more snow in winter, in spite of some added warmth and a shorter winter, and cooler (and hence less ablation) summers. A low index type such as WILLETT describes (1949) would give colder winters but a PETTERSSEN (1949) low index type (weak zonal flow and strong southerly flow from Central Europe to Scandinavia, plus dry anticyclonic weather) would also result in warm winters and low precipitation—hence in greater ablation. No proof exists, however, of the validity of either theory. *Subject Headings:* **1. General circulation 2. Glacier retreat 3. Glacier ablation theories 4. Northern Scandinavia.**—*M.R.*

8.11–63 551.311.17(261)

Steinborn, E., **Eisverhältnisse bei Neufundland und Cape Breton Island Ende April bis Anfang Mai 1957.** [Ice conditions off Newfoundland and Cape Breton Island, end of April to beginning of May 1957.] *Wetterlotse*, No. 120/121:174–176, July/Aug. 1957. fig. **DLC**—Positions of 26 icebergs on April 30, 1957 were shown in Ice Bulletin outside S. limits of ice field. By May 9 this had increased to 75 besides hundreds of growlers. Distribution on May 6 is described. *Subject Headings:* **1. Iceberg distribution 2. Newfoundland Banks.**—*C.E.P.B.*

8.11–64 551.311.182

Eckel, O. (*Vienna*), **Statistisches zur Vereisung der Ostalpenseen.** [Statistics on the freezing of the East Alps lakes.] *Wetter und Leben*, Vienna, 7(3/4):49–57, 1955. fig., 5 tables, 7 refs. **DLC**—Average freezing dates based upon data for the period 1895–1950 are presented in tables for various lakes in the Eastern Alps. Data include beginning of icing period, beginning and end of complete closure, and end of ice period. The nature of the observations upon which the means are based and special icing characteristics of particular lakes are discussed, and empirical formulas relating icing data to sea level elevation are presented. *Subject Heading:* **1. Freezing of lakes.**—*I.L.D.*

8.11–65 551.311.182

Burdecki, F., **Vereisung, Meereshöhe und Wärmespeicherung von Gebirgsseen.** [Freezing, height above sea level and heat storage of mountain lakes.] *Wetter und Leben*, Vienna, 8(1/2):27–28, 1956. 2 refs., 2 eqs. **DLC**—The author discusses the linear relationships between freezing and height above sea level in the Eastern Alps that appeared in **Statistisches zur Vereisung der Ostalpenseen** (*Wetter und Leben*, 7(3/4):49–57, 1955) by O. ECKEL (*see* 8.11–64). The observations indicate that a paraboloid relationship exists between freezing and height above sea level and lines for the beginning and the end of freezing are two branches of one curve. The minimum curve obtained from the mean of all observations would probably be then above the line of elevation above sea level—100–250 meters. The "anomaly" of Neusiedler Lake is considered in relation to the absence of stored heat. A new empirical

relationship is suggested having depth also as a parameter. *Subject Heading:* **1. Freezing of lakes.**—*I.L.D.*

GEOMAGNETISM

See also: **Poles of general circulation and geomag. poles** (Mironovitch), 8.11–194.

8.11–66 530.38:523.7

Notuki, M.; Nakagomi, Y. and Fukatsu, M., **Solar corona and geomagnetism.** *Japan. Science Council. Ionosphere Research Committee, Report of Ionosphere Research in Japan*, 9(4):215–221, **1955.** 3 figs., 26 refs. **DWB**—1) Both coronal activity and geomagnetic disturbance seem as a whole to vary in the same sense as the general solar activity. But a negative correlation between the two phenomena is seen during the period near the minimum solar activity. 2) The latitude of the active coronal center appears to have fairly large influences on geomagnetic disturbance. The smaller the difference is between the heliocentric latitude of the active center and that of the earth, the larger the effect seems to be. 3) The active coronal region looks as if it had a strong shielding effect on the general outflow of corpuscles from the undisturbed areas of the sun and it may greatly concern the local sources of corpuscular streams. *Subject Headings:* **1. Solar magnetic relationships 2. Solar activity.**—*Authors' abstract.*

8.11–67 523.78:550.38

Volland, H., **Zur Feinstruktur des erdmagnetischen Sonnenfinsterniseffektes.** [The fine structure of the geomagnetic solar eclipse effect.] *Journal of Atmospheric and Terrestrial Physics*, 11(1):1–13, **1957.** 7 figs., 6 refs., 25 eqs. German and English summaries p. 1. **DWB**—The theory of the geomagnetic eclipse effect is extended by the introduction of empirical functions and by a thorough discussion of the induction effect on the interior of the earth and other influences, so that a quantitatively correct distribution of the effect is possible. It is then shown that in consequence of the height dependence of the geographical location of the umbra a decision can be made as to the height of the center of the current bearing layer. A method of determining the direction of the *Sq* current during an eclipse is mentioned. *Subject Headings:* **1. Solar eclipse effects 2. Geomagnetic effects.**—*Trans. of author's abstract.*

8.11–68 523.74:550.38

Watson, R. A., **Magnetic activity following a solar flare.** *Journal of Atmospheric and Terrestrial Physics*, 11(1):59–61, **1957.** table, 2 refs. **DWB**—Intervals between a sudden flare effect and sudden commencement of magnetic activity (1949–54) ranged from 0 to >72 hrs and were randomly distributed. *Ap* (world wide *Kp* index of magnetic activity) showed a steady rise from time of sudden flare effect until well into 3rd day. It is concluded that if a stream of particles is ejected from a flare it rarely causes an appreciable magnetic disturbance within 3 days. *Subject Headings:* **1. Solar flares 2. Geomagnetic activity.** —*C.E.P.B.*

8.11–69 550.384:551.735(944)

Irving, E., **Directions of magnetization in the Carboniferous glacial varves of Australia.** *Nature*, London, 180(4580):280–281, Aug. 10, **1957.** 4 figs., table, 8 refs. **DWB**—New South Wales Upper Carboniferous varved sediments have an average magnetic inclination of 84° and indicate pole positions near Lord Howe Island and Madeira. They are 80–90° away from positions given by Mississippian and Pennsylvanian of U. S. and Lower Carboniferous of Britain, either because field in Northern Hemisphere was dipolar or because W. Europe and E. Australia have moved relative to each other. *Subject Headings:* **1. Paleomagnetism 2. Carboniferous period 3. New South Wales.**—*C.E.P.B.*

8.11–70 551.1:550.384.3

Quiring, Heinrich, **Kontinentdrift und Erdmagnetismus.** [Continental drift and geomagnetism.] *Forschungen und Fortschritte*, Berlin, 31(7):193–196, July **1957.** 2 figs., 14 refs. **DLC**—There are local irregularities of the magnetic field due to layers of iron ore, which in S. Africa give an inclination of 90°, but this does not mean that the N. or S. pole was formerly in S. Africa. The Gulf Stream imposes a peculiar structure of the isodynamic lines, very

different from Tertiary and Mesozoic. In Triassic, magnetic intensity in England resembled the present in N. Africa, but this does not mean England has moved northward, only a decrease of crustal temperature. The westerly drift of the earth's crust assumed by BLACKETT is also an error. The continents do not move, only the magnetic field lines. Every geological chart of circumpolar plant and animal zones since Cambrian is against hypothesis of pole movement. *Subject Headings:* **1. Continental drift 2. Magnetic secular variations.**—*C.E.P.B.*

ASTRONAUTICS

8.11–71 629.19

Lawrence, Lovell, Jr., **"Astro"—an artificial celestial navigation system.** *Franklin Institute, Phil., Journal of the Franklin Institute Monographs*, No. 2:89–99, June **1956.** table, 7 refs., 7 figs. **DWB**—This paper treats the peaceful use of "Astro," an "Artificial Satellite Time and Radio Orbit" to be established over the earth for celestial navigation purposes. Every effort has been made to create a simple, yet reliable, system that may be feasible in the near future. To accomplish this, however, a very high degree of accuracy must be maintained in the electronic components. Methods for observing this high-velocity body by other than optical means will be necessary, and accurate time signals must be generated. The selection of 105-min. polar orbits *versus* 24-hr orbits will be discussed, and some consideration will be given to the design of the Astro Satellite—including methods for propagating electromagnetic wave signals of one hundred megacycles—together with a review of a nuclear power source for supplying the necessary electrical energy. Reference will be made to the standard celestial navigation techniques, using circles of equal altitude obtained from an electronic sextant. To establish a fix, an arrangement will be explained for obtaining lines of position by interpreting observed Doppler frequency deviation *versus* position distance from the satellite. A graph of this Doppler shift, and a Mercator position plotting sheet will be used to describe a typical aircraft flight. *Subject Headings:* **1. "Astro" 2. Satellite observatories.**—*Author's abstract.*

8.11–72 629.19:621.396

Miczaika, G. R., **Das Internationale Geophysikalische Jahr VII "Projekt Vanguard." Beobachtungs- und Nachrichtenmittel des künstlichen Erdsatelliten.** [The IGY, Pt. 7, "Project Vanguard." Methods of observation and transmission of the artificial earth satellite.] *Umschau*, 57(13):394–396, July 1, **1957.** 3 figs. **DLC**—The scientific value of the satellite depends on how far it is possible to follow its track and record the values which it transmits. After projection it will be located by interference of two radio signals. If this fails, a combined visual-photographic method will be used. *Subject Heading:* **1. Satellite observatories.**—*C.E.P.B.*

AERONAUTICAL METEOROLOGY

See also: **Slant visibility** (Stewart), 8.11–257; 8.11–258.

8.11–73 551.551:629.135

Eggleston, John M. (*Langley Aeronautical Lab., Langley Field, Va.*), **A theory for the lateral response of airplanes to random atmospheric turbulence.** *U. S. National Advisory Committee for Aeronautics, Technical Note*, No. 3954, May **1957.** 75 p. 13 figs., 2 tables, 21 refs., 65 eqs. **DLC**—The power spectra of the lateral motions of an airplane flying through continuous random isotropic turbulence are derived in terms of airplane transfer functions, the power spectra of coefficients relating the lateral moments and forces to gust velocities, and the power spectra of the three orthogonal components of gust velocities along the flight path. Random variations of gust velocities across the span and along the fuselage are considered. Three example airplanes are used to demonstrate the method, trends, and simplifications. Comparisons with less comprehensive methods are drawn. *Subject Headings:* **1. Turbulence effects on airplanes 2. Turbulence spectrum.**—*Author's abstract.*

8.11–74 551.501.81:551.574.7

Battan, Louis J. (*Univ. of Chicago*), **Vertical scanning air-borne radar for reducing hazards of aircraft icing and ground collisions.** *Aeronautical Engineering Review*, N. Y., 15(12):52–54,

Dec. 1956. 4 photos., 6 refs. **DLC**—Air-borne radar with horizontal scanning is standard equipment for avoiding turbulence, but vertical scanning equipment would help detect areas of supercooled water drops as distinguished from areas of ice crystals which would not provide an icing hazard. It also would give better terrain clearance warning. Such scanning has been used in cloud physics studies for a number of years. A bright band echo indicates melting snow and hence no hazard. Sets now in use could be modified for vertical scanning. *Subject Headings:* **1. Air-borne weather radar 2. Vertical scanning radar 3. Ice avoidance in flight 4. Icing of aircraft.**—*M.R.*

8.11–75 551.55:656.7

*Bedekar, V. C. (*Met. Off., Poona*), **Mean effective tailwinds along some Indian air routes.** *Indian Journal of Meteorology and Geophysics*, Delhi, 8(1):81–87, Jan. **1957.** 5 figs., 5 tables, 5 refs., eqs. **DWB, DLC**—Mean effective tailwinds are computed from data for all years up to 1950 for the Delhi-Allahabad-Calcutta, Bombay-Nagpur-Calcutta, Bombay-Poona-Hyderabad, and Hyderabad-Jagdalpur-Calcutta routes for 2 and 3 km, respectively, for each month. These values when compared with those published by the Air Ministry (London) are considerably higher, especially for the winter months (and March–May on Delhi-Calcutta route). This is said to be due to the greater amount of data used. Theory and method of computing mean effective tailwinds, as well as tabular and graphic presentation of data and discussion of results, are included. In winter and spring, 3 km winds are stronger than 2 km winds but the reverse is true, in general, in the summer. Highest effective tailwinds are usually in Feb. (on Bombay-Hyderabad route, maximum winds are at 2 km in July). *Subject Headings:* **1. Mean effective tailwinds 2. Aeronautical meteorology 3. Upper air winds 4. India.**—*M.R.*

8.11–76 551.589.5:656.71

Osmun, W. G. (*Assoc. Ed., Aviation Age*), **How to pick ILS runway.** *American Meteorological Society, Bulletin*, 38(4):210–211, April **1957.** 2 figs., photo. **DWB**—Before you decide on an ILS runway, you must carefully study the frequency of instrument weather, wind directions and speeds. This involves the right ceiling and visibility increments and allowing for such operational factors as cross-wind components. If you don't make this study, your ILS may wind up in the wrong place, and you'll have done your airport out of many otherwise usable flying hours. *Subject Headings:* **1. Airport landing conditions 2. Airport runway location.**—*Author's abstract.*

8.11–77 551.50:656.7(09)

Schreiber, K., **Zwischen Gestern und Heute. Eine flugmeteorologische Skizze.** [Between yesterday and today. An aeronautical meteorological sketch.] *Germany. Deutscher Wetterdienst in der US Zone, Berichte*, No. 38:380–382, **1952. DWB**—A brief history of the development of aviation meteorological services in Germany. *Subject Headings:* **1. History of meteorology 2. Airline meteorological services 3. Germany.**—*C.E.P.B.*

8.11–78 551.5:629.135

U. S. Air Weather Service, **AWS flying safety program.** Its *Manual*, 62-5, March 1, **1956.** 37 p. 6 figs., table. AWS manual for analysis, evaluation, and prevention of weather factor accidents. **DWB**—Of all U.S.A.F. aircraft accidents in 1947–54 about 10% were due to weather factors and 1% due to Air Weather Service deficiencies such as erroneous forecasts of cloud, ceiling, visibility, thunderstorms or winds. Moreover the trend in both categories has been downward: 14.5% in 1947–52 to 9% in 1954 and 4% to 2% for percent of all accidents and percent of those which were due to A.W.S. deficiencies. The manual is aimed at further reduction of such accidents and consists mainly in establishing details of administrative procedures when serious accidents occur (as regards notification, reporting details for investigations, statistics to be maintained and provided, a weather factor code, indoctrination program for pilots as to weather factors, facilities and avoidance by use of knowledge of meteorology or use of weather radar). *Subject Headings:* **1. Aircraft accident prevention 2. Weather effects on aircraft accidents.**—*M.R.*

AGRICULTURAL METEOROLOGY

See also: **Problems of air-flow in agric.** (Gloyne), 8.11–199.

8.11–79 551.509.59:63:016

†U. S. Dept. of Commerce, **Weather forecasting services for agriculture; reports of the Secretary of Commerce and the Acting Secretary of Agriculture on steps taken to improve and expand horticultural and agricultural weather forecasting services, pursuant to S. Res. 82, 84th Congress, 1st session.** Wash., D. C., U. S. Govt. Print. Off., 1956. 23 p. fig., bibliog. p. 11–13. U. S. 84th Cong., 2d sess., 1956. Senate, Document No. 97. **DLC**—The agrometeorological activities of the U. S. W. B. during the war years (1940–45) were drastically curtailed due to lack of funds, but from 1946–55 some increased or improved service for farmers, horticulturists and forestry interests is noted in the chronological list of U. S. W. B. activities in these fields, which is presented in this report. A map of the U. S. shows U. S. W. B. fire weather forecast districts and a 2½ page bibliography gives references to articles, etc. on agricultural meteorology subjects, publ. during 1941–55 by U. S. W. B. personnel. *Subject Headings:* **1. Agricultural meteorology 2. Agrometeorological forecasting 3. Agricultural meteorology bibliographies 4. United States.**—*M.R.*

8.11–80 551.509.59:63

Palmer, Wayne C. (*Office of Climatology, U. S. W. B., Wash., D. C.*), **Weather service to agriculture in the Western Great Plains.** *American Meteorological Society, Bulletin*, 37(9):458–461, Nov. 1956. **DWB, DLC**—Remarks on the usefulness of forecasts and climatological information to farmers in the semiarid regions of the Great Plains written by a meteorologist with 4 years of experience in farming. Ordinary forecasts of showers are considered of little value. General moisture, wind, blizzard or cold wave forecasts can be of use and if they could be made a week or two in advance would double the efficiency of farm operations. Drought, dust storms, hail and observational representativeness (e.g., with respect to amount of snow in fields or amount of moisture in effective soil levels after a rain) are also discussed. *Subject Headings:* **1. Agricultural meteorology 2. Agrometeorological forecasts 3. Great Plains, U. S.**—*M.R.*

8.11–81 551.501.9:63

Bogatyr', T. K., **Ob opyte raboty agrometeorologicheskikh postov v kolkhozakh, sovkhozakh i MTS Ukrainskoĭ SSSR.** [Work of the agrometeorological stations on collective farms, state farms and motor and tractor stations, Ukraine, U.S.S.R.] *Meteorologiia i Gidrologiia*, No. 7:37–39, July 1956. **DWB, DLC**—The author discusses the organization of a network of voluntary weather observers on state farms by the Ukrainian Hydro-Meteorological Service, provisions for working up the recorded observations, the program of observatories, the use of the observations in agriculture, climatology, etc. *Subject Headings:* **1. Agrometeorological stations 2. Ukraine, U.S.S.R.**—*I.L.D.*

8.11–82 551.5:633.71

Beall, James M. (*U. S. Weather Bureau*), **Weather and the production of burley tobacco.** *American Meteorological Society, Bulletin*, 38(2):52–58, Feb. 1957. 9 figs., table, 10 refs. **DWB, DLC**—Tobacco is an economically important crop in the United States. It is grown under a variety of climatic conditions each imposing its particular microclimatological and micrometeorological effects. The curing of burley tobacco depends particularly on the proper control of relative humidity. A humidity forecasting project started in 1954 in Kentucky by the Weather Bureau with the cooperation of the University of Kentucky has resulted in that some farmers using the service have received up to 7 cents a pound more than parity for their tobacco. Consequently the Weather Bureau has decided that the service is well worth while. *Subject Headings:* **1. Tobacco cultivation 2. Humidity forecasting 3. Agrometeorological forecasting 4. United States.**—*Author's abstract.*

8.11–83 551.5:633.71

Hamon, Russell W. (*Agricultural Meteorologist, U. S. W. B.*), **Weather and burley tobacco curing. Based on cooperative project between the U. S. W. B. and the Kentucky Agricultural**

Experiment Station. Wash., D. C., U. S. Weather Bureau, Dec. 1954. 20 p. 3 tables, 4 refs. **DWB**—About 68% of the nations burley tobacco crop is grown in Kentucky—a crop worth $206 million in 1953. Weather is important during preparation of seed beds, sowing, transplanting, spraying, growing and harvesting. Precipitation, temperature, humidity, soil moisture, radiation, wind, and hail are important elements. Humidity and temperature are the vital factors in curing. A comprehensive program of observations of humidity and temperature and precipitation and of analysis of the data in terms of quantity of tobacco cured under varying conditions, and of forecasting tobacco curing conditions is described. A conservative estimate of saving to farmers which might result from adequate forecasts during curing is about $10 million a year. *Subject Headings:* **1. Tobacco curing weather 2. Agrometeorological forecasting.**—*M.R.*

8.11–84 551.509.5:632.9:633.491

†§Bourke, P. M. Austin, **Use of synoptic weather maps in potato blight epidemiology.** *Eire. Meteorological Service, Technical Note,* No. 23, March 1957. 35 p. 14 maps, 26 refs. **DWB**—The synoptic weather situations which lead to weather favourable and unfavourable to potato blight are discussed. The principles are then applied to the 1956 potato growing season in Ireland, U.K. and Northwest Europe, and the conclusions derived from weather maps alone are shown to be in agreement with the observed appearance and spread of the disease. The value of meteorological charts as a supplement to the different systems in use for potato blight forecasting is further illustrated by a general review of the 1952–55 season, and by examples which refer to Prince Edward Island, Virginia, U. S., and south Chile. The method provides a link between studies in blight epidemiology and advanced research work in synoptic meteorology. *Subject Headings:* **1. Potato blight epidemiology 2. Potato blight forecasting.**—*Author's abstract.*

8.11–85 551.509.62:551.524.37:632.111.33

Burckhardt, Hans, **Verbeugender Frostschutz und Frostschutz durch Beregnung.** [Preventive frost protection and frost protection by sprinkling.] *Germany. Deutscher Wetterdienst, Mitteilungen,* 3(16):26–53, 1956. 23 figs. (incl. photos). **DWB**—This comprehensive paper which contains numerous pertinent diagrams, photographs and maps comprises the following subjects: microclimatic sites of frost sensitive crops and the mapping of frost danger; protection against frost by climatic improvements such as regulation of cold air flow, blocking of cold air advection, removal of cold air sources, establishment of artificial water surfaces etc.; and frost protection by sprinkling including direct and indirect sprinkling. *Subject Headings:* **1. Frost protection 2. Sprinkling 3. Frost danger.**—*I.L.D.*

8.11–86 551.509.62:551.510.42:66

Malkevich, M. S., **K voprosu o zashchite rastenii ot zamorozkov dymovymi savesami.** [Protection of plants from frosts by smoke screens.] *Akademiia Nauk SSSR, Geofizicheskii Institut, Trudy,* No. 23(150):119–133, 1954. 3 figs., 4 refs., 76 eqs. **DLC**—The physical processes involved in the relationship between changes in effective radiation from the earth's surface produced by a smoke screen and changes in the temperature within the smoke layer are investigated. Equations are developed for analyzing the temperature changes and the resulting radiational regime within the smoke layer and the temperature regime during repeated action of temperature and radiation factors over a continuous time interval. *Subject Headings:* **1. Frost protection 2. Smoke screens 3. Smoke effects on temperature changes 4. Smoke effects on radiation.**—*I.L.D.*

8.11–87 551.509.62:551.524.37:632.111.3

Schmitt, Norbert, **Vorschläge und Wünsche der Landwirtschaft zur Sicherung der Kulturen vor Frostschäden.** [Suggestions and needs of agriculture for crops against frost damage.] *Germany. Deutscher Wetterdienst, Mitteilungen,* 3(16):16–23, 1956. photo. **DWB**—Beginning with a brief account of the monetary value of the frost damage in the Rhineland-Palatinate during the past several years the author outlines the functions and duties of a frost warning service; various measures to be adopted for preventing frost damage (these include pamphlets, frost protection conferences, demonstrations of frost prevention techniques

and establishment of model areas with frost prevention measures) and various agricultural practices helping to prevent or minimize frost damage. *Subject Headings:* **1. Frost protection 2. Frost damage 3. Rhineland-Palatinate, Germany.**—*I.L.D.*

8.11–88 551.508.72:581.11

†Halkias, N. A.; Veihmeyer, F. J. and Hendrickson, A. H., **Determining water needs for crops from climatic data.** *Hilgardia*, Berkeley, Calif., 24(9):207–233, Dec. **1955.** 13 figs., 7 tables, 47 refs. **DWB**—Examination of data on evaporation and related phenomena obtained at various stations in California at various times between 1930 and 1950, and a review of literature on evaporation measurement methods and the determination of transpiration leads to the conclusions that the inexpensive white spherical Livingstone atmometer yields values sufficiently close to evaporation from a free water surface; that the difference in evaporation between black and white atmometers is a good indicator of (a) the use of water by crops and (b) solar radiation as measured by an Eppley pyrheliometer. Thus the use of water by plants may be calculated from data obtained with black and white atmometers or, if such are not available, from incident energy measured with the Eppley pyrheliometer. *Subject Headings:* **1. Evapotranspirometers 2. Livingstone atmometer.**—*G.T.*

8.11–89 551.556.2:632.51

Illner, K., **Über den Einfluss von Windschutzpflanzungen auf die Unkrautverbreitung.** [On the influence of wind breaks on the spread of weeds.] *Angewandte Meteorologie*, 2(12): 370–373, May **1957.** 4 figs., table, 7 refs. **DLC**—Wind-distributed seeds, sinking mainly at 2–3 sec/m, were scattered to windward of an artificial wind break and collected on glass plates in and beyond the breaks ($h = 2$ and 6 m). In open land number of particles decreased steadily down wind, behind obstacles they reached a maximum at a distance of 3–6 h and exceeded deposit in a free wind for some distance. Thus wind breaks do not hinder the spread of windborne weed seeds. *Subject Headings:* **1. Wind breaks 2. Weed distribution.**—*C.E.P.B.*

8.11–90 551.58:63

Winter, E. J. and Stanhill, G., **Horticultural climatology at the National Vegetable Research Station.** *Weather*, 12(7):218–222, July **1957.** 2 photos, 10 refs. **DWB**—A crop-weather station was set up at the National Vegetable Research Station, Wellesbourne, in 1949, with special equipment for the study of evaporation and transpiration. Relation between evaporation from an open water surface and evaporation + transpiration from the soil-crop system is being investigated; ratio fell from 0.9 when cores were at field capacity to 0.4 with soil moisture deficit 4.2″. Many other researches in progress are mentioned. *Subject Headings:* **1. Agricultural meteorology. I. National Vegetable Research Station, Wellesbourne, Eng.**—*C.E.P.B.*

FOREST METEOROLOGY

See also: **Problems of air-flow in forestry** (Gloyne), 8.11–199; **Wind shelter hedges** (Trienes), 8.11–200; **Afforestation of catchment areas** (Bleasdale), 8.11–203; **Forest effects in catchment areas** (Laurie), 8.11–205.

8.11–91 551.508.29:551.524.3:551.525.2:551.588.6(433)

Baumgartner, A. and Hofmann, G., **Elektrische Fernmessung der Luft- und Bodentemperatur in einem Bergwald.** [Electrical distant measurement of air and soil temperature in a mountain wood.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 8(2): 215–230, **1957.** 11 figs., 3 tables, 7 refs. German, English and French summaries p. 215–216. **DWB**—Temperatures were measured in Sept. 1955 by thermistor at 6 places, 635–1325 m a.s.l., along a deforested stretch 3 km long on the Grosser Falkenstein, covering soil 10 cm deep, trunk space (3 m), crowns (15–20 m) and above tops of trees (30–45 m). Results are shown by graphs and isopleths for valley, slope and hill top, for midday, evening and morning. Influence of altitude and dynamics of slope air are discussed. Finally, observations at 2 m in the forest paths are compared with those at 3 m in the forest. *Subject Headings:* **1. Forest climatology 2. Bavaria, Germany.**—*C.E.P.B.*

8.11–92 634.94:551.571

Mařan, Boh., **Příspěvek ke studiu vlivu podrostů na relativní vlhkost vzduchu přízemních vrstev.** [Influence of undergrowth on the relative humidity of the atmospheric surface layers.] *Československá Akademia Zemedelská, Prague, Sborník,* 21:5–12, **1949.** 2 figs., 2 tables, bibliog. p. 10–11. English and Russian summaries p. 11–12. **DLC**—Relative humidity was measured at 20 cm above ground level at intervals of 30 min., from 6 a.m. onwards on individual spring, summer and autumn days in 1940 and 1943, in mixed Pine/Larch stands (with and without Oak/Hornbeam underwood) and Birch stands (with and without underwood of Spruce), on a warm, dry area in central Bohemia. Results are given in tables and graphs. They show that the humidity regime of stands with underwood was more equable than that of stands without. During the day-time in the growing season the former always showed the higher humidity. This difference was most marked in the early afternoon, in summer and early autumn, and on cloudless days, i.e., under conditions of low humidity and high temperature in general. *Subject Headings:* **1. Forest undergrowth effects on humidity 2. Humidity measurements 3. Bohemia, Czechoslovakia.**—*Forestry Abstracts.*

8.11–93 551.5:632.187

Louisiana. State Univ. School of Forestry, **Modern forest fire management in the South: Proceedings of the 4th Annual Forestry Symposium, Baton Rouge, April 6–7, 1955.** 113 p. figs., ports., tables. **DWB**—A group of informal papers on forest fire protection in the Southeastern States. The importance of weather, turbulence, fire danger ratings, winds, winds aloft, fire whirlwinds, etc. in propagating fires, is brought out in paper by George M. Byram on **Possible causes of blowup fires,** (p. 24–35), and the one by Ralph M. Nelson, on **The principles and uses of fire danger measurement,** (p. 36–45). In the former paper, data, graphs, photographs of fires and schematic diagrams are used to illustrate wind shear or convective column structure. *Subject Headings:* **1. Fire weather studies 2. Wind effects on forest fires 3. Southeastern United States.**—*M.R.*

8.11–94 551.524:595.7

Rudinsky, J. A. and Vite, J. P., **Effects of temperature upon the activity and the behavior of the Douglas fir beetle.** *Forest Science,* Wash., D. C., 2(4):258–267, Dec. **1956.** 5 figs., table, 7 refs. **DWB**—The Douglas fir beetle (*Dendroctonus pseudotsugae,* Hapk.) is one of the most destructive insects in the Pacific Northwest. It responds to temperature; but not as a constantly increasing activity but rather as a change in mode of activity after certain threshold temperatures are passed. Below 0–1°C there is no activity, from 1° to 3°C activity markedly increases, boring activity increases rapidly from 4° to 28°C, but has a secondary maximum at 12°C. Flight begins abruptly at 18°–28°C running activity at 4°–5°C, optimum activity at 26°–28°C and paralysis or death at 33° to 36°C, depending on humidity. At low humidity death occurs at 33°C, at high humidity at 36°C. Tests were made in winter of 1955–April 1956. *Subject Headings:* **1. Forest entomology 2. Temperature effects on insects.**—*M.R.*

8.11–95 551.5:634.9

Rutkovskii, V. I., **Šířeji rozvinout výzkumy z lesnického vodního hospodářství a lesnické meteorologie.** [For a more extensive development of research in forest water economy and forest meteorology.] *Meteorologické Zprávy,* Prague, 7(2):51–52, **1954.** Translated by V. Krečmer from the Russian original in *Lesnoe Khoziaĭstvo,* No. 2, **1953. DLC**—Stresses importance of meteorological and hydrological research in forestry planning and recommends establishment of research organizations and observation networks in the U.S.S.R. *Subject Headings:* **1. Forestry 2. Forest meteorology research.**—*G.T.*

8.11–96 634.956:551.577.3(438)

*Dunikowski, Stanisław, **Wpływ warunków atmosferycznych na przestrzenne zróżnicowanie wyników upraw wiosennych w roku 1953.** [Influence of atmospheric conditions upon plantation effectiveness in Poland in 1953.] *Roczniki Nauk Lésnych,* Warsaw, 11(140):131–143, **1955.** tables, 5 refs. Russian and English summaries p. 142–143. Review by Max Onno in *Wetter und Leben,* Vienna, 8(1/2):144, **1956. DLC**—On a map of effective plantation of seedlings in 1953 throughout Poland, four zones of effectiveness are distinguished, viz. zones

1 and 2 of little effectiveness (under 85%), zone 3 slightly over 85% and zone 4 up to 96%. For every zone an analysis of climatological factors was made. This analysis as well as comparison of map of effective plantation with monthly isohyets indicate that zones 1 and 2 had unfavorable atmospheric conditions for spring plantation, especially deficiency of rainfall and its uneven distribution in time. Territorial zoning of successfulness of plantation in 1953 does not reveal any obvious relationship with the division of Poland into natural forest provinces. *Subject Headings:* **1. Forest nurseries 2. Rainfall 3. Poland.**—*From author's abstract.*

8.11–97 551.524.36:634.956

Silen, Roy R. (*Pacific Northwest Forest and Range Exper. Sta., Forest Serv., U. S. Dept. of Agri., Portland, Ore.*), **Use of temperature pellets in regeneration research.** *Journal of Forestry*, 54(5):311–312, May **1956.** photo, 6 refs. **DLC**—Experiences with a novel system for measuring soil surface temperatures in seedling beds where exposure to insolation might be critical, but where knowledge of maximum temperature to within 5° or 10°F is not required, are described. For instance, Douglas fir seedlings begin to perish at >123°F and newly sprouted fir and hemlock seedlings usually die at 123° to 140°F. Commercial temperature pellets which are cheap enough to use extensively in sampling are superior to thermometers, thermocouples or thermographs as they can accurately represent conditions in the hairline surface at the soil. Tablets are $\frac{7}{16}''$ by $\frac{1}{8}''$, are insoluble, accurate, colored, last at least a year and come at various melting temperature: 113°, 125°, 138°, 150° and 163°F with a ±1% error. *Subject Headings:* **1. Temperature pellets 2. Maximum temperature measurements in seedbeds 3. Forest meteorology.**—*M.R.*

8.11–98 551.584.2 551.586

Wagner, H. and Hunger, W., **Über Besonnungsverhältnisse im Raume des Elsterer Kessels in ihrer Bedeutung für forstliche Standortsfragen.** [Insolation conditions in the region of the Elster basin in their importance for forest sites.] *Angewandte Meteorologie*, 2(12):365–369, May **1957.** 5 figs., table, 9 refs. **DLC**—The relative insolation on slopes of different direction and steepness was calculated from a contour map, and used for qualitative determinations of suitability for various types of forest. Maps are given of mean annual insolation and growth (soil moisture) conditions. *Subject Headings:* **1. Insolation 2. Elster Basin, Germany.**—*C.E.P.B.*

8.11–99 551.5:625.1

Yoshioka, S. and Kimura, T., **Fires along railway.** *Journal of Meteorological Research*, Tokyo, 4(9):729–730, Feb. **1953.** 2 figs., 2 tables. In Japanese; English summary p. (45). **MH-BH**—The author reports an investigation of fires along the railways of the Fukuchiyama Railway Operating Division leading to the following conclusions: 1) fires frequently occur in spring, especially in April, 2) almost all of them occur in a few hours in the afternoon (12–17 h), 3) fires appear to be favored by synoptic situations characterized by travelling high and warm sector type pressure distribution, a minimum humidity below 40% and a wind velocity of 6–8 m/s. *Subject Headings:* **1. Fire weather 2. Railways 3. Japan.**—*Authors' abstract.*

INDUSTRIAL METEOROLOGY

See also: **Hoar frost studies** (Orlicz, Orliczowa), 8.11–226.

8.11–100 628.8:551.586

Bach, Kurt, **Moderne Klima-Anlagen für Wohn- und Bürogebäude.** [Modern climatic installations for dwelling houses and offices.] *Umschau*, 57(16):492–494, Aug. 15, **1957.** 6 figs. **DLC**—In Germany preferred room temperature is 16–22°C in winter, 21–27°C in summer, humidity 30–60%. Clothing being lighter in summer, contrast with outdoors should not exceed 3–4°C. Modern homes and offices, especially in U. S., are constructed of steel, aluminium and glass to let in as much light and heat as possible. Purification of air is becoming more important. Examples of installations are given. *Subject Heading:* **1. Air conditioning.**—*C.E.P.B.*

8.11–101 551.509.58:6

Collins, George F. (*E. I. du Pont de Nemours & Co., Wilmington, Del.*), **A severe weather service for industry.** *American Meteorological Society, Bulletin*, 37(10):514–516, Dec. **1956. DWB**—The du Pont Company has recently set up a weather advisory service to supplement United States Weather Bureau services. Installation of weather teletype-writers and instrument facilities enables special forecasts to be made for maintenance shutdowns, equipment testing, barging operations, shipment of commodities subject to damage by weather extremes, and the issuing of severe weather warnings for company operations which might be affected. *Subject Headings:* **1. Industrial forecasting 2. Industrial weather services 3. E. I. du Pont de Nemours and Co.**—*Author's abstract.*

8.11–102 551.5:672

Hanselman, Michael, **Steel.** *Weatherwise*, 6(2):53, April **1953. DWB**—A brief note on the uses made by the Jones and Laughlin Steel Corp. of the services of a meteorological consultant. Specifically the problems are: a) shipping of ore and finished steel on the Great Lakes where freezing or storm conditions handicap operations, b) snow and rain affecting rail shipments of ore or products, c) corrosive or other effects of high humidity or excess of moisture at the factories and furnaces, d) control of air pollution and e) climatological studies for management. *Subject Headings:* **1. Industrial meteorology 2. Steel industry 3. Jones and Laughlin Steel Corp.**—*M.R.*

8.11–103 551.556.3:621.311.24

Nilakantan, P., **Utilization of wind power in India.** *World Meteorological Organization, WMO Bulletin*, 5(2):49–51, April **1956. DWB**—The CSIR of India set up a Wind Power Sub-Committee in Dec. 1952, to make preliminary investigations of available wind power and economic aspects of use of wind energy. Work was started by examining available meteorological data on surface winds. Speed, duration and power duration curves were prepared by the India Met. Dept. A correlation factor was established between the annual mean hourly wind speed and available power in specified speed ranges for various regions. Extrapolation is now being undertaken from weather stations to favorable wind sites which usually have higher speeds. Uses in rural areas for pumping, grinding etc., are being explored. E. W. Golding of the United Kingdom made a survey which was encouraging. *Subject Headings:* **1. Wind power utilization 2. India.**—*M.R.*

8.11–104 551.5:62

Reidat, R., **Was kann die Meteorologie der Technik bieten?** [What can meteorology offer technology?] *Wetter und Leben*, Vienna, 7(8/11):176–185, **1955.** 5 figs., 2 tables, 9 refs. **DLC**—Various aspects of cooperation between meteorology and technology are discussed with the aid of specific, detailed examples. Some of the illustrations include the following: providing data on weather extremes to reduce to a minimum weather damage, frequency distribution of daily mean temperatures for heating and air conditioning and their graphical presentation, data on the duration of specific meteorological elements such as mean daily temperature below 0°C for heating installations, data for construction of the ASHVE climatic comfort diagrams for determining characteristics of room climates, statistical interrelationships of all the various weather elements (with the aid of punch card method), etc. In addition to climatological analysis, technology needs continuous meteorological advice: an example of this is estimating the heat production by central heating plants in relation to temperature and wind conditions. *Subject Headings:* **1. Engineering meteorology 2. Comfort climate 3. Heating and ventilating.**—*I.L.D.*

8.11–105 551.509

Thompson, J. C. (*W.B.A.S., Los Angeles*) and Brier, G. W. (*U. S. W. B., Wash., D. C.*), **Economic utility of weather forecasts.** *Monthly Weather Review*, Wash., D. C., 83(11):249–254, Nov. **1955.** 2 figs., 3 tables, 8 refs., 12 eqs. **DWB, DLC**—Methods of analysis for measuring the economic utility of a weather forecast and verification procedures "based upon the operational risks involved in taking protective action against adverse weather" are presented. Equations are developed for an economic decision criterion and for providing a quantitative measure of the value of any categorical weather prediction where the economic risks are

specified; the calculation of the economic value of forecasts for any given value of economic risks by means of verification data for a series of probability forecasts is illustrated. The determination of the order of magnitude of the economic gains resulting from categorically issued public forecasts and the relation between the formulas of economic usefulness and formulas used to assess forecasting skill are discussed. *Subject Headings:* **1. Economics of weather forecasts 2. Forecast verification.**—*I.L.D.*

8.11–106 551.521.1:621.47

World's first solar electric station. *Current Science*, Bangalore, 25(10):317, Oct. **1956. DWB, DLC**—World's first automatic solar electric station designed by USSR Academy of Sciences Inst. of Power Engineering, announced for Ararat Plain in Armenian SSR (because of duration and intensity of sunshine there). Plant will consist of a 130′ rotating steel tower, with 23 circular railway tracks in which 1293 large mirrors (215,000 sq ft area) will be oriented so as to constantly reflect sunlight on flat walls of the boiler. Power will go to pump water from subsoil onto fields. Exhaust stream will heat hothouses and hotbeds, baths, laundries and furnish power to turn the tower and run trains. *Subject Headings:* **1. Solar electric power stations 2. Ararat Plains, Armenian SSR.**—*M.R.*

8.11–107 551.5:625.1

Liebsch, F. (*Vienna*), **Die Bedeutung des amtlichen Wetterberichtes für den Betrieb der Österreichischen Bundesbahnen.** [Importance of the official weather service for the operation of the Austrian federal railroads.] *Wetter und Leben*, Vienna, 7(8/11):194–195, **1955. DLC**—The daily weather reports of the Zentralanstalt für Meteorologie und Geodynamik are studied by the Austrian federal railways with special reference to avalanche and flood occurrence, manpower deposition during rush periods such as week ends, etc. *Subject Headings:* **1. Railway meteorology 2. Avalanche warnings 3. Austria.**—*I.L.D.*

PUBLIC HEALTH

See also: special bibliography on **Medical meteorology,** p. 1518.

8.11–108 551.515.2:614

Burney, L. E. (*Surgeon General, U. S. Public Health Service*), **Public health problems in major disasters.** *American Academy of Political and Social Science, Annals*, 309:80–88, Jan. **1957. DWB**—It is impossible to predetermine rigidly the public health problems in major disasters or the official relief actions to be taken; each disaster presents its own characteristics. Good public health organization must, in such circumstances, be able to co-operate quickly with other relief agencies, identify and evaluate actual and potential public health hazards, mobilize existing health resources, take emergency measures to control or eliminate hazards and restore public health facilities. The co-operative functioning of local, state, and federal health agencies is described by the author, and especially the organization and work of the federal Public Health Service in disaster operations. The author illustrates the functioning of the Service in connection with the outbreak in 1952 of mosquito-borne encephalitis in the Central Valley of California and the 1955 hurricane and floods in the northeastern states. *Subject Headings:* **1. Weather disasters 2. Public health.**—*Author's abstract.*

8.11–109 551.510.42:614.7

Drinker, Philip, **Air pollution and the public health. Harben lectures.** *Smokeless Air*, No. 102:252–253, Summer **1957. DWB**—Three lectures in London on May 13, 14 and 15, 1957. The first discussed fogs in Meuse Valley (1930), Donora (1948) and especially London (1952). The second dealt with nitrogen oxide troubles in Los Angeles (40–80 times a year) and the third with fluorosis in cattle. *Subject Headings:* **1. Atmospheric pollution effects 2. Public health.**—*C.E.P.B.*

8.11–110 551.586:615.834

Trauner, L., **Medicinska meteorologija u Hrvatskoj.** [Medical meteorology in Croatia.] *Yugoslavia. Hidrometeorološka Služba, Vesnik*, 5(1/2):1–15, Jan./June **1956.** 4 figs., 3 tables, 27 refs. **DWB**—Medical meteorology has a long history in Croatia where it has had more

attention than in any other state of Yugoslavia. Foremost among the problems studied in the past and present are the therapeutic effects of the Adriatic sea shore and other regions, and climatic properties of the many health resorts. Croatian medical meteorology literature is reviewed. The problem of classification of climatic factors according to their biological effects is discussed. Stations in Croatia where weather observations are now being made for medical purposes are listed and the need for establishment of a central institute for medical meteorology is stressed. *Subject Headings:* **1. Medical meteorology 2. Health resorts 3. Croatia, Yugoslavia.**—*G.T.*

8.11–111 551.586:616

†Lippert, E., **Kritische Bemerkungen zur Meteorotropie zirkulatorischer Insulte.** [Critical remarks on the meteorotropy of circulatory disturbances.] *Angewandte Meteorologie*, 2(12):355–365, May **1957.** fig. bibliog. p. 363–365. **DLC**—Circulation disturbances include: 1) thromboses, embolisms, infarcts and apoplexes; 2) paroxysmal hypo- and hypertonicity; 3) functional or organic cardiovascular phenomena. These are described and classified, and effect of stimulation discussed, biotropic weather processes being listed. Stimulation may be subjective, e.g., thermoregulation, or through the central nervous reception acting on cell regulation. Meteorotropy depends on the detailed meteorological situation, clinical limitation of the pathological process under investigation, and phase. Then follow a number of results by different authors. Results are set out in a rather complicated diagram. *Subject Headings:* **1. Bioclimatology 2. Circulatory diseases.**—*C.E.P.B.*

8.11–112 551.586:612.014.43:591.11

†Bass, David E. and Henschel, Austin (*both, Environmental Protection Div. Quartermaster Res. and Dev. Center, Natick, Mass.*), **Responses of body fluid compartments to heat and cold.** *Physiological Reviews*, Wash., D. C., 36(1):128–144, Jan. **1956.** table, 106 refs. **DLC**—A comprehensive and critical review of the physiological literature dealing with the influence of heat and cold upon body fluids with special reference to man. The author discusses the effect of seasons and of hot and cold weather upon blood volume; the effect of acute heat stress upon plasma water, plasma and blood volume, sweat secretion and renal function; the effect of prolonged exposure to heat upon plasma and blood volume; the changes in body fluid presumably associated with acclimatization to heat; the results of acute cold exposure including cold diuresis, changes in blood and plasma volume, and in circulating red cell and protein volume, the effect of hypothermia on body fluids; the influences of prolonged exposure to cold upon fluid volume, water and electrolyte metabolism; and the relation between acclimatization to cold and blood volume. *Subject Headings:* **1. Physiological climatology 2. Heat effects on man 3. Cold effects on man 4. Acclimatization 5. Cloud chemistry.**—*I.L.D.*

8.11–113 551.586:61

Fieber, Sigrid, **Die Einflüsse meteorologischer Faktoren auf den menschlichen Organismus.** [Influence of meteorological factors on the human organism.] *Akademie der Wissenschaften, Berlin, Wissenschaftliche Annalen*, 5(7):582–588, July **1956.** 2 figs., 10 refs. **DWB, DLC**—The author reviews some of the literature dealing with the effect of weather elements and weather processes, such as upper air frontal disturbance including upslope and downslope of air, etc., upon the production and incidence of organic diseases, incidence of death and physiological responses. The possibility that long wave high frequency radiation is the medium whereby meteorological processes exact their influence upon human beings and the role of the vegetative nervous system as the stimulus receptor are considered. *Subject Headings:* **1. Medical meteorology 2. Meteorological influences on disease.**—*I.L.D.*

ARTIFICIAL RADIOACTIVITY IN ATMOSPHERE AND OCEAN

See also: **Nuclear radiation measurements during IGY** (Bolin), 8.11–22; **Nuclear explosions and potential gradient variations** (Pierce), 8.11–264.

8.11–114 551.574.1:551.594.14:612.2

*Chamberlain, A. C.; Megaw, W. J. and Wiffen, R. D. (*all, Health Phy. Div., Atomic E. Res. Est., Berks*), **Role of condensation nuclei as carriers of radioactive particles.** *Geofisica*

Pura e Applicata, Milan, 36:232–242, Jan./April **1957.** 5 figs., 4 tables, 11 refs., eqs. **DLC**—Radon and thoron decay products are easily attached to condensation nuclei. The high diffusion constant of RaA and ThB (almost the same as for positive ions), results in a high percentage of these products being deposited in the upper respiratory tract when they are uncombined (15–30%) whereas if combined with bunsen nuclei the deposition is 1000 times less (.03–.06%). The combined products are apt to be found in the alveoli rather than the nose, trachea or bronchi as are the uncombined products. The products can be used as radioactive tracers for nuclei just as condensation or ionization properties of nuclei can be used to tag them in chambers or electrical apparatus, respectively. Experiments are described in detail. *Subject Headings:* **1. Radioactive nuclei tracers 2. Thoron deposition in respiratory tract 3. Respiratory system retention of radioactive nuclei.**—*M.R.*

8.11–115 551.594.14

Israël, Hans, **Das natürlich-radioaktive Milieu unserer Umwelt.** [The natural radioactivity of our environment.] *Naturwissenschaftliche Rundschau*, 10(7):249–252, July **1957.** 2 figs., 6 tables. **DWB**—Natural radioactive substances belong mainly to the series Uranium 238 and 235 and Thorium 232, each of which includes a gaseous emanation which diffuses in soil air and into atmosphere ("exhalation"). The cycle is set out quantitatively, including height distribution to 5 km (radon, alpha and beta + gamma radiation). *Subject Heading:* **1. Radioactivity in the atmosphere.**—*C.E.P.B.*

8.11–116 551.5:623.454.8

Jílek, Josef, **Vodíkové pumy a vývoj počasí.** [Hydrogen bombs and weather development.] *Meteorologické Zpravy*, Prague, 9(5/6):148, **1956.** 3 refs. **DWB**—The author briefly discusses the possible weather effect of thermonuclear explosions and concludes that the energy released is too small for such an effect but the problem of dust particles carried aloft by an explosion remains to be clarified. *Subject Heading:* **1. Hydrogen bomb effects.**—*G.T.*

STATISTICS

See: **Statistical study of rain** (Levert), 8.11–12; **Limitations to predictions** (Gleeson), 8.11–151; **Standard deviations of mean temp.** (Jenkinson), 8.11–186; **Statistical techniques for study of climatic change** (Craddock), 8.11–253.

8.11–117 551.501.4:519.24

Boyd, D. W. and Kendall, G. R. (*Met. Branch-Dept. of Transport-Toronto*), **Statistics of extreme values.** *Royal Meteorological Society, Canadian Branch, (Publications)*, 7(2):1–11, Oct. 18, **1956.** 4 figs., 2 tables, 5 refs., eqs. **DWB.** Also issued as: Canada. Meteorological Div., CIR-2825, TEC-238, Oct. 9, **1956.** 8 p. 4 figs., 2 tables, 5 refs. **DLC**—Gumbel, Thom and Jenkinson's methods of compiling extreme value curves from meteorological data are applied to annual maximum wind speed data for Victoria, B. C. (32 yrs.). Jenkinson's gives a curve concave upward (68 mph for a 50-yr period), Gumbel's an almost straight line (73 mph) and Thom's a convex curve (77 mph). Reasons for differences in results are analyzed. *Subject Headings:* **1. Extreme value theory 2. Extreme winds 3. Victoria, British Columbia.** —*M.R.*

8.11–118 551.501.45:519.241.1

Conrad, V., **Brief note on estimating the significance of a correlation coefficient.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 8(2):257–259, **1957.** fig., table, 2 refs. English, German and French summaries p. 257. **DWB**—A table and curves are given showing values of correlation coefficient which are 4 and 6 times the probable error, for 10–300 pairs of observations. *Subject Heading:* **1. Correlation coefficients.**—*C.E.P.B.*

8.11–119 551.5:31(03)

Interamerican Statistical Institute, Washington, D. C., **Statistical vocabulary. Vocabulario estadistico. Vocabulário estatistica. Vocabulaire statistique.** Published by the Institute, June **1950.** 117 p. diagrs. In English, Spanish, Portuguese, and French. **DWB**—Comprises 1800 English statistical terms and their equivalents in Spanish, Portuguese and French, prepared after 2 years of circulation of a preliminary list of terms. This vocabulary

not only helps to standardize and shorten terminology, but serves as a reference work for translators or students working in statistics or statistical applications to such fields as meteorology. *Subject Headings:* **1. Glossaries 2. Statistical terminology 3. English language 4. French language 5. Spanish language 6. Portuguese language. I. Wurzer, Rose A.**—*M.R.*

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

See also: **Mt. met. stations** (Kirigin), 8.11–35; **Radio. obs.** (Smith-Rose), 8.11–37; **Air-borne weather radar** (Baltan), 8.11–74; **Agromet. stations on collective farms** (Bogatyr'), 8.11–81; **Statistics of extreme values** (Boyd, Kendall), 8.11–117; **Estimating the significance of a correlation coefficient** (Conrad), 8.11–118; **Psychrometric nomogram** (Kallós), 8.11–133; **Zonal circulation** (Bykov, Mashkovich), 8.11–166; **Turbulence scale** (Dryden), 8.11–197; **Radar rainfall measurement** (Hiser, Conover), 8.11–237; **Carbide method of soil moisture method** (Heigel), 8.11–247.

8.11–120 551.501.7:551.557:551.507.3

Giles, Keith C. and Peterson, Roy E., **Velocity departures from geostrophic flow as measured from constant level balloon data.** General Mills, Inc. Mechanical Div., Contract AF 19(604)-1180, Scientific Report, No. 1, Feb. 10, **1956.** 20 p. 8 figs., 2 tables, 6 refs., eqs. —Constant level balloon data are used to compute 89 smoothed hourly values of velocity, and a corresponding number of values of the balloon geostrophic velocity are obtained by considering the accelerations. These values are then compared with geostrophic winds computed from constant pressure maps. It is found that the direction of the balloon velocity approximates that of the geostrophic velocity very closely (with a probable error of ±7.2°) and that the magnitude of the balloon velocity can be used by a regression equation to estimate the geostrophic speed. *Subject Headings:* **1. Upper air wind measurement 2. Constant level balloons.**—*Authors' abstract.*

8.11–121 551.501.7:551.513.2:551.557

Pauly, J. and Menin, R. (*Service Met. de Metropole et d'Afrique du Nord, Paris*), **Formule approchée donnant la vitesse maximum du vent dans un "jet."** [Approximate formula giving the maximum speed of wind in a jet.] *Journal Scientifique de la Météorologie,* Paris, 6(22):69–72, April/June **1954.** 2 figs., 4 eqs. **DWB**—An examination of the profile of wind velocities at a given isobaric level perpendicular to a jet shows that the profile can be assimilated to a double Couette current. On the assumption of geostrophic flow it is possible to determine, by using two radiosondes to measure winds on each side of the jet, the maximum velocity of the wind in the axis of the jet with an approximation available for routine purposes. *Subject Headings:* **1. Jet stream profiles 2. Jet stream speed.**—*Based on author's abstract.*

8.11–122 551.501.81:551.553.8:551.515.41(54)

*De, A. C.; Das, P. M. and Gangopadhyaya, M. (*all, Met. Off., Dum Dum*), **Regenerative drift of a thunderstorm squall of the southwest monsoon season.** *Indian Journal of Meteorology and Geophysics,* Delhi, 8(1):72–80, Jan. **1957.** 6 figs., table, 5 refs. **DWB, DLC**—A radar scope analysis of a thundersquall line on Sept. 20, 1954 (SW monsoon) over NE India is compared with synoptic analysis and it is shown that the squall passed Dum Dum Airport (where the meteorological (3 cm) radar is located) and Alipore Observatory 10 mi SW at about the same time, and Barrackpore 10 mi NW, 75 min later. Barograph, thermograph, hydrograph, pluviograph and anemograph records for Dum Dum and Alipore are reproduced to show sharp onset of this unusual squall. Structure of line squall is discussed. Regenerative action is considered necessary for maintenance of the cell, whose dimensions are thought to be greater than those observed during the Thunderstorm Project. *Subject Headings:* **1. Thunder squall analysis 2. Radar analysis of thunder squalls 3. Northeast India.**—*M.R.*

8.11–123 551.501.81

Hiser, Homer W. and Freseman, W. L., **Radar meteorological studies, May 19, 1955 to May 19, 1956.** Miami. Univ. of (Coral Gables, Florida). Marine Laboratory, Contract

NOas 55-620-d, Final Report, May 1956. 35 p. 22 figs., photos, refs. **DWB**—The accomplishments during May 1955–56 under this contract included installation and tests of performance of 4.7 and 10.7 cm radar under different storm and precipitation conditions at Miami. Comparison of the S-band and C-band radar during a squall line, cold front, warm front and air mass showers in March–May 1956 led to conclusion that under right conditions, the 10.7 gives equal resolution and greater distance for detection of showers, etc., than 4.7 cm equipment. Smoke and hurricane spiral bands were studied and 3 case studies of heavy precipitation or squall lines over Gulf Stream and one small tornado described and illustrated. *Subject Headings:* **1. Radar meteorology 2. Radar weather studies 3. Weather radar installations 4. Hurricane spiral bands on radar 5. Miami, Fla.**—*M.R.*

8.11–124 551.501.81:551.577

Soane, Christine M. (*Met. Serv. of Federation of Rhodesia and Nyasaland*), **Cyclonic rotation in a radar echo.** *American Meteorological Society, Bulletin*, 38(5):269–273, May **1957.** 2 figs., 3 refs. **DWB, DLC**—On the morning of Jan. 21, 1955, between 0130 and 0330 hrs (local time), cyclonic rotation was present in an area of radar echo near Salisbury, Southern Rhodesia. This is known from the photographic records made of the PPI of the 10 cm radar at Salisbury. The diameter of the rotating echo was about 20 mi and the normal rainfall observations show that between 1 and 1.6 in. of rain fell in this area, at approximately the time of the echo rotation. This phenomena was accompanied by thunder and lightning but no evidence can be found of exceptional surface wind behavior. *Subject Headings:* **1. Radar echo rotation 2. Radar precipitation echoes 3. Salisbury, Southern Rhodesia.**—*Author's abstract.*

8.11–125 551.501.81:551.515.2(766,781)

Staats, Wayne F. (*U. S. W. B.*) and Turrentine, Charles, M. (*Oklahoma A. & M. College*), **Some observations and radar pictures of the Blackwell and Udall tornadoes of May 25, 1955.** *American Meteorological Society, Bulletin*, 37(10):495–505, Dec. **1956.** 25 figs. (incl. photos), 5 refs. **DWB**—Some accounts of meteorological conditions along the paths of these two severe tornadoes are described. Photographs of 3 centimeter radar of the Oklahoma A. & M. College sferics project show the development of a cyclonic protuberance out of the left rear quadrant of the radar echo similar to those previously observed in Illinois, Texas, and Massachusetts. Other similarities in the development of these tornadoes to the Massachusetts tornadoes of June 9, 1953, are pointed out. The average speed of radar echoes passing through the area of the tornadoes increases from 18 to 63 knots in a little more than one hour. *Subject Headings:* **1. Tornadoes, Oklahoma-Kansas (May 1955) 2. Radar analysis of tornadoes 3. Blackwell, Okla. 4. Udall, Kansas.**—*Authors' abstract.*

8.11–126 551.501.83:551.521.6

Abbott, W. N., **Quelques interessantes variations du souffle de fond observées sur les fréquences de 17.6 Mc/s.** [Some interesting variations of static noise at frequencies of 17.6 Mc/s.] *Journal of Atmospheric and Terrestrial Physics*, 11(1):72–74, **1957.** fig., ref. English summary, p. 72. **DWB**—Observations of static on 17.6 Mc/s at St. Omer at 2 hr intervals (1 hr before, 1 and 3 hrs after sunset) show a slight decrease (0.6 dB) after sunset in winter and spring. This disappears in July to Sept. when the presence of the center of the Galaxy counterbalances loss of reception cone. It is attributed to descent of F layer. On 5 Mc the effect is opposite. *Subject Heading:* **1. Twilight effects on sferics.**—*C.E.P.B.*

OBSERVATIONAL DATA

See also: **Met. obs., N. Pole** (Van der Bijl), 8.11–29, 8.11–30; **Met. obs., Antarctica** (Lepineux), 8.11–31; **Historic weather records, Hammelburg** (Seyfert), 8.11–44.

8.11–127 551.506.1:551.578.42(73)

Ludlum, David M., **Snowfall notes for winter 1954–55.** *Weatherwise*, Boston, 9(1):22–25, Feb. **1956.** photo, map. **DWB**—Reports from New England, Middle Atlantic States, South, Lower Lakes, Upper Lakes, Northern Plains, Pacific States and Rocky Mountains give details of snow for 1954–55 season. Map of U. S. shows southern limit of measurable snowfall (Southern Texas and Gulf States) and maximum depths for each state. Crater Lake in

Oregon (6475 ft) had 140″ at end of April and Paradise Ranger Station on Mt. Rainier (Wash.) had 232″ at 5550 ft. Both set records for April. Mt. Rainier had 788″ for year. *Subject Headings:* **1. Snowfall, United States** (1955) **2. United States.**—*M.R.*

8.11–128 551.506.1:551.524.37(73)

Ludlum, David M., **Winter strikes early in 1955–56.** *Weatherwise*, Boston 9(1):32–33, Feb. 1956. 4 figs. **DWB**—Temperature was below normal all over the U. S. in Nov. (−16°F anomaly in Montana) and in all but the S.W. in Dec. (−10° in Dakota). Other features, including West Coast rains in Dec., are shown on charts and discussed. *Subject Headings:* **1. Winter weather, United States** (1955–56) **2. Severe winters 3. United States.**—*M.R.*

8.11–129 551.506.1(73/9):551.524.36

Ludlum, David M. (*ed.*), **The vagaries of spring 1954.** *Weatherwise*, 7(3):70–73, June 1954. figs. **DWB**—Five cyclonic storms which occurred during March are described in detail revealing the character of the month—stormy and cold, with spotty precipitation. Except for the first week in April, when −17° (lowest on record for New England in April) was recorded in New Hampshire, the month of April was warmer than usual over all but the Pacific Northwest. Precipitation during April was spotty, too, with drought continuing in the southwest, though temporarily relieved in central Texas. *Subject Headings:* **1. Record low temperatures 2. Extreme temperatures 3. Monthly climatic summaries 4. United States.**—*M.R.*

8.11–130 551.506.8

Kibardin, R. E., **O metodakh predvychisleniia srokov zatsvetaniia granata i sozreveniia fleshei chaia.** [Methods of precalculating the time of flowering of the pomegranates and the ripening of tea.] *Meteorologiia i Gidrologiia*, Leningrad, No. 2:34–35, Feb. 1956. table. **DWB, DLC**—The calculation of constants of temperature sums for predicting the date of flowering of pomegranates and ripening of tea is described. For the former temperatures above 5°C are reviewed, the constant being 626°C; for the latter the lower temperature limit is 10°C and the constant is 112°C. A table giving earliest and latest dates of flowering of pomegranates and ripening of tea is presented. *Subject Headings:* **1. Phenological observations 2. Pomegranate phenology 3. Tea phenology.**—*I.L.D.*

8.11–131 551.506.8:634.23

Koyano, M., **Flowering period of the cherry (*P. yedoensis*) in 1954.** *Japan. Central Meteorological Observatory, Tokyo, Memoirs of Industrial Meteorology*, 18(2):117–120, March 1955. 4 figs., 2 tables. In Japanese; English summary, p. 120. **DLC**—The author investigated the growing conditions from budding to flowering of the cherry (*P. yedoensis*) in Kanto District and obtained results as follows: 1) Observed weight, length and width of buds are shown. 2) The cherries in the central part of Tōkyō-to flowered in the period from March 26th to 28th. This flowering period is 5 days earlier than that of the normal year, perhaps owing to higher temperatures in March. 3) The average of the first flowering dates at various places in Kanto District for many years is deduced from altitude and latitude by the following equation: $E=2.06\ \mathrm{OH}+4.638\ (\phi-35°)\ 88.72$, where, at a certain place, E: the first flowering date (in days, counting from Jan. 1), H: altitude above the mean sea level, ϕ: latitude. The distribution of flowering dates in Kanto District calculated from the above equation is shown. *Subject Headings:* **1. Cherry blossom forecasting 2. Phenological observations 3. Japan.**—*Author's abstract.*

INSTRUMENTS

See also: **Livingstone atmometer for determining water needs for crops** (Halkias et al.), 8.11–88; **Thermistor temp. measurement in a wood** (Baumgartner, Hofmann), 8.11–91; **Constant level balloon measurement** (Giles, Peterson), 8.11–120; **Apparatus for observing air showers** (Cranshaw, Galbraith), 8.11–183; **Nuclei counters** (Hall), 8.11–216; **Icing of meteorographs** (Gvelesiani), 8.11–227.

8.11–132 551.508.54:551.551.21

Wise, W. B., **The hot-wire anemometer for turbulence measurements, Pt. I.** *Great Britain. Aeronautical Research Council, Current Papers*, No. 273, 1956. 8 p. Wise, W. B.

and Stewart, D. R., **Pt. 2,** *Ibid.*, No. 274, **1956.** 5 p. Wise, W. B. and Schultz, D. L., **Pt. 3–4,** *Ibid.*, No. 275 and 276, **1956.** 35+16 p. figs., refs., eqs. Mimeo.—Pt. I describes the circuit for turbulence measurements. The wire is heated by a constant direct current. Velocity variations cause a change of temperature and therefore of resistance and voltage. Some improvements are described, including radio-frequency heating. Experiments to test these are described in Pt. II, indicating that the system should be useful in measurement of high-frequency turbulence. In Pt. III further experiments are described, using both radio-frequency and direct current heating. The techniques described can be used for measurement of turbulence at high air speeds. In Pt. IV measurements of turbulence level and spectra at subsonic and supersonic speeds and the heat loss over the transonic range are described. *Subject Headings:* **1. Hot wire anemometers 2. Turbulence measurement.**—*C.E.P.B.*

8.11–133 551.508.71:551.501.6:518.3

Kallos, Imre, **Pszichrométer nomogram.** [A psychrometric nomogram.] *Időjárás*, Budapest, 60(4):221–226, July/Aug. **1956.** 4 figs., 3 refs., 5 eqs. Russian and German summaries p. 221. English trans. p. XI–XIV. **DLC**—An adjustable nomogram is developed for use with data obtained either with aspiration type or with August-type psychrometers, even in the case of icing of the wet bulb thermometer. Dry and wet bulb temperature can be set with 0.1°C accuracy. Values of vapor pressure, dew point and relative humidity are obtained with accuracies of 0.1 mm Hg, 1°C and 0.5%, respectively. The nomogram is based on the formula $e=E'-A\frac{p}{755}(t-t')$, where e=vapor pressure, A=the psychrometric constant, p=atmospheric pressure, t=dry bulb temperature, t'=wet bulb temperature and E'=saturation vapor pressure for the wet bulb temperature. *Subject Headings:* **1. Psychrometric diagrams 2. Nomograms.**—*Trans. of author's abstract.*

8.11–134 551.508.71:551.571

Saito, R., **On the homogeneity of observed values of vapor pressure and relative humidity.** *Journal of Meteorological Research*, Tokyo, 8(6):327–334, July **1956.** 4 figs., 4 tables. In Japanese; English summary p. 327. **DWB, DLC**—The greatest discontinuity in the vapor pressure and relative humidity records of Japan was produced by the introduction of ventilated (wet bulb) thermometers in 1950. Correction factors are subject to local, seasonal and diurnal variations. *Subject Headings:* **1. Homogeneity of data records 2. Ventilated psychrometers 3. Japan.**—*G.T.*

8.11–135 551.508.72

Solopko, A. A., **Isparitel' dlia mikrometeorologicheskikh nabliudenii.** [Evaporimeter for micrometeorological observations.] *Meteorologiia i Gidrologiia*, Leningrad, No. 1:54–56, Jan. **1956.** 2 figs., 2 tables. **DWB, DLC**—Evaporation was measured by means of an evaporimeter in which the evaporating water surface consists of a round piece of wetted filter paper 25 cm² in area placed in the hollow of a metallic washer. Water is supplied to the filter through a 3 mm opening. The evaporated water is measured by means of the water added to the washer by a special burette. The results of evaporation measurements in several crop rotation fields carried out during May–Oct. are compared with those made by the method of water balance. *Subject Heading:* **1. Evaporimeters.**—*I.L.D.*

8.11–136 551.508.72

Stružka, Vladimír, **Evaporigraf pro mikrometeorologická měření.** [Recording evaporimeter for micrometeorological measurement.] *Meteorologické Zprávy*, Prague, 9(1):18–23 **1956.** 11 figs., 3 refs. Russian and German summaries p. 18. **DWB**—The recording evaporation meter developed by the author and described in this paper is based on the Piché evaporimeter. Photographs and diagrams of the instrument and its electrical circuit are presented. The apparatus is especially suited for detailed micrometeorological observation. Other evaporation instruments are mentioned and illustrated. *Subject Heading:* **1. Recording evaporimeters.**—*G.T.*

8.11–137 551.508.762

Friedland, Stephen S.; Katzenstein, Jack; Sherman, Jack and Zatzick, Michael R., **mproved instrumentation for searchlight probing of the stratosphere.** Connecticut. Univ. ?hysics Dept., Contract AF 19(604)-290, Final Research Report, May 1956. parts separately ›aged. 37 figs., 2 tables, 6 eqs.—An optical pulse searchlight system, based on radar techiques, has been developed for measuring the density profile of the upper atmosphere. A ight source which emits 50 megalumens, 20 u-sec. in duration, is placed at the focal point of a 0" mirror. A photomultiplier, which is part of a logarithmic recording system covering a lynamic range of four orders of magnitude, is placed at the focal point of a similar mirror. Each time the light is pulsed an entire density profile is obtained. An altitude above 40 km ıas been observed. Suggestions and methods for obtaining signals from higher altitudes re discussed. The data obtained to date agrees with the results of previous investigators ınd theoretical calculations. *Subject Heading:* **1. Searchlight soundings.**—*Authors' abstract.*

8.11–138 551.508.77:551.578.46

Henning, Hubert, **Ein neuer Schneepegel für höher gelegene Stationen und Bergstationen.** [A new snow gage for high level and mountain stations.] *Zeitschrift für Meteorologie*, 10(11): 345, Nov. 1956. fig., table. **DLC**—Snow depth sometimes reaches 3 m and often contains cy layers. For mountain stations over 1000 m author recommends hand gages with point ınd staff 2 m long and an auxiliary section 1 m long. The point is triangular steel and the staff vood strengthened with duralumin. *Subject Heading:* **1. Snow gages.** –*C.E.P.B.*

8.11–139 551.508.91:551.510.42:616

Lawther, P. J., **Some analytic and clinical methods in the study of atmospheric pollution.** *Instrument Practice*, London, 11(6):611–615, June 1957. 5 figs., 13 refs. **DLC**—Methods of measuring SO_2 concentration and smoke are described, including electron micrographs of smoke. Plants are used as "instruments" in Los Angeles and bronchitis patients at St. Bartholomew's Hospital in London. *Subject Heading:* **1. Atmospheric pollution measurement.** —*C.E.P.B.*

SYNOPTIC ANALYSIS AND FORECASTING

See also: **Statistical bases for forecasting** (Baur), 8.11–2; **Agromet. forecasting** (U. S. Dept. of Commerce), **8.11–79; Agromet. forecasts** (Palmer), 8.11–80; **Potato blight forecasting,** 8.11–84; **Frost protection by smoke screens** (Malkevich), 8.11–86; **Frost prevention** (Schmitt), **8.11–87; Ind. forecasting** (Collins), 8.11–101; **Econ. utility of forecasts** (Thompson), **8.11–105.**

8.11–140 621.369.02:551.509.2 621.397.9:551.509.2

Seilkopf, H., **Vom Scheinwerfersignal bis zur Bildfunk-Wetterkarte.** [From searchlight signal to television chart.] *Wetterlotse*, No. 122:185–187, Sept. 1957. 2 figs. **DLC**—In 1907 North Dyke radio began sea weather and storm warnings for fisheries. They were directed to the fishing cruiser "Ziethen" which distributed them in the North Sea by optical signals, especially powerful searchlights at night. Improvements kept pace with advances in radio, leading to spoken broadcasts from the "Meerkatze" and "Anton Dohrn" in 1950 and from June 1, 1957 to televised charts from North Dyke. Two examples are reproduced. *Subject Headings:* **1. Radio weather messages 2. Television weather broadcasts 3. North Dyke radio station.**—*C.E.P.B.*

8.11–141 551.509.312:551.43

Estoque, Mariano A., **A graphically integrable prediction model incorporating orographic influences.** *Journal of Meteorology*, 14(4):293–296, Aug. 1957. 5 figs., 2 tables, 6 refs., 10 eqs. **DWB**—Error patterns of sea-level prognoses over N. America are closely related to Rocky Mts. To incorporate effects of sloping terrain a 2-level model is used and procedure described with an example. Incorporation of orographic effect resulted in a great improvement of the forecast. *Subject Headings:* **1. Numerical forecasting 2. Orographic influences.** —*C.E.P.B.*

8.11–142 551.509.312:551.513.1

Gates, W. Lawrence, **Hemispheric numerical forecasting with the barotropic model and some remarks on boundary-condition error,** *Journal of Meteorology*, 14(4):332–342, Aug. 1957. 13 figs., 2 tables, 11 refs., eq. **DWB**—A barotropic model was used for forecasting 2-dimensional 500 mb quasi-geostrophic motion for Jan. 16–25, 1953, for 24, 48 and 72 hrs. General accuracy decreased up to 72 hrs; best performance was eastern U. S. (correlation of observed and predicted 24-hr changes >.95). Accumulation of forecast errors is shown by results for Jan. 22, and improvement of accuracy by hemispheric scheme over limitation to N. America is pointed out. Causes of forecast errors are discussed under numerical manipulations, those inherent in the physical model (especially ignoring of baroclinicity) and those due to inadequacies of observations. Research on these is in progress. *Subject Headings:* **1. Numerical forecasting 2. Barotropic models.**—*C.E.P.B.*

8.11–143 551.509.317:551.576

Palmer, Clarence E.; Nicholson, James R. and Shumaura, Richard M., **Indirect aerology of the tropical Pacific.** California. Univ. Institute of Geophysics. Oahu Research Center Contract AF 19(604)-546, Final Report, June **1956.** 131 p. 16 figs., 2 tables, 13 refs., 69 plates (all photos). List of publications under the Contract, p. iv–vi. **DWB**—One-third of the troposphere lies over tropical oceans, yet in these vast areas there are few aerological stations compared even to the polar regions. To compensate for this lack of direct aerological data, indirect aerology, differing somewhat from that used by BERGERON-FINDEISEN to fill in gaps in polar (frontal) aerology, but maintaining much of the same character with respect to cloud analysis, must be resorted to. The bulk of this report consists in a large number of excellent cloud photos taken in the tropical Pacific and their interpretation in line with filling in gaps in streamline and vertical motion analysis of proximal and distal systems. *Subject Headings:* **1. Tropical wind analysis 2. Indirect aerology of tropical Pacific 3. Cloud aerology 4. Tropical Pacific.**—*M.R.*

8.11–144 551.509.317:551.515.4(54)

Rai Sircar, N. C. (*Met. Off., Poona*), **On the forecasting of Nor'westers in Gangetic West Bengal.** *Indian Journal of Meteorology and Geophysics, Delhi,* 8(1):21–32, Jan. **1957.** 7 figs. 7 tables, 4 refs. **DWB, DLC**—A comparative study has been made of the upper air data based on radiosonde ascents at Calcutta and Allahabad, in relation to two distinct classes of days namely, those of widespread Nor'westers of the pre-monsoon season over Gangetic West Bengal and those altogether free from such storms. It is seen that the most important contributory factors to the genesis of well developed Nor'westers are, increased humidity resulting in suitable distribution of wet bulb temperatures in the first two kilometers and cyclonic convergence in the lower moist air field to provide the initial impulse for upward convection and that the advection of colder air at higher levels is not an essential criterion. A nomogram using dry bulb and dew point temperature values at 850-mb level in the morning has been suggested to serve as an empirical, but quite a useful, tool for the forecasting of Nor'westers over Gangetic West Bengal during the pre-monsoon season. *Subject Headings:* **1. Northwester forecasting 2. Upper air analysis 3. Nomograms 4. West Bengal, India.**—*Author's abstract*

8.11–145 551.509.317:55.1515.4(54)

Venkateswara Rao, D. and Boothalingam, P. N. (*Regional Met. Center, Calcutta*), **On forecasting the time of incidence of Nor'westers at Calcutta.** *Indian Journal of Meteorology and Geophysics,* Delhi, 8(1):61–66, Jan. **1957.** 2 figs., 4 tables, 6 refs. **DWB, DLC**—The speed of travel of the downdrafts from regenerative Nor'wester sequences in southwest Bengal has been investigated by analyzing data of times of their outbreak at Calcutta, Asanol and Hazaribagh. This is found to lie roughly between 30 and 40 mph. There are scarcely any thundersqualls at Calcutta before 1600 IST caused by parental storms at interior stations. Thunderstorms so generated are most frequent during 1700 to 1900 IST at Calcutta. The highest gust speeds in Nor'wester squalls also appear to be confined to this period. Thunderstorms occurring during 1100–1200 IST at Hazaribagh or 1400–1500 IST at Asansol produce squalls reaching 60–90 mph at Calcutta. From these results, simple rules for forecasting the time of incidence and speed likely to be attained in Nor'wester squalls at Calcutta have

een deduced. *Subject Headings:* **1. Northwester forecasting 2. Thunderstorm time incidence . Calcutta, India.**—*Authors' abstract.*

8.11–146 551.509.317:551.511(265)

§Williamson, E. A., **Some charts of the 1000–500 MB relative divergence over the Tasman ea area.** *New Zealand. Meteorological Office, Technical Note,* No. 89, May 16, **1952.** 16 p. harts, 10 refs. **DWB**—The difference between the isobar icdivergence at two levels has been valuated for a number of situations over the Tasman Sea area, using a formula developed by UTCLIFFE. Discussion of the charts suggests that the technique can have only limited pplication with the sparse network of aerological stations in this area. *Subject Headings:* **. Divergence 2. Upper air analysis 3. Tasman Sea.**—*Author's abstract.*

8.11–147 551.509.318:551.524.37

§Kallós, Mrs. Imre, **Az 1953. évi májusi fagy szinoptikai vizsgálata.** [Synoptic study f the frost of May 1953.] *Beszámolok az* 1955-*ben vegzett tudományos kutatásokrol* (issued as *Iungary. Országos Meteorológiai Intézet, Hivatalos Kiadványai,* Vol. 20, pub. **1955**), p. 79–85. figs., ref. Russian and French summaries p. 79. **DWB**—Synoptic situations during freezing veather in May 1952 and 1953 are compared. Inspection of synoptic data for a 15-year eriod shows that freezing weather in Hungary is caused by Scandinavian anticyclones but hat it depends on the position of cyclones whether such an anticyclone effect will materialize nd how severe the freezing weather will be. *Subject Headings:* **1. Spring frosts 2. Synoptic tudies.**—*G.T.*

8.11–148 551.509.318:551.513:551.515(93)

§Karelsky, S., **Classification of the surface circulation in the Australasian region.** *Aus- ralia. Bureau of Meteorology, Meteorological Study* No. 8, April **1956.** 36 p. 94 figs., 10 efs. **DWB**—A continuation of the study of the circulation types of Australian region (*see* .4–142, April 1956, *MAB*) which the author bases on the Multanovskiĭ school of extended orecasting. Surface weather types are classified according to degree or type of cyclonicity r anticyclonicity for an 8-yr period (1946–53). Natural period, areas which constitute ources of anticyclogenesis or cyclogenesis, seasonal variation in frequency of types in con- ection with radiation balance of said regions, areas of frontogenesis and frontolysis for the lifferent types, a description of types and illustration of their main features and use in fore- asting for 4–5 day periods, are treated with numerous examples of cyclonicity and anti- yclonicity charts appended. *Subject Headings:* **1. Synoptic types 2. Cyclonicity charts . Circulation types 4. Extended forecasting 5. Australasia.**—*M.R.*

8.11–149 551.509.33

§Zikmunda, Otakar (*Inst. of Met. & Climatology, Charles Univ., Prague*), **Forecast of the veather for days of 9–11 November 1950 by the Sutcliffe method of evolution.** Translation No. 350 (unidentified source). 350 p. 12 figs., 5 refs., 9 eqs. **DWB.** Original Czech in *Meteorologické Zpravy,* Prague, 6(4):100–195, Sept. **1953. DWB**—A test of the SUTCLIFFE nethod was made for Nov. 9–11, 1950, to find out to what extent the field of relative divergence an be used in synoptic forecasting. The computed D field was compared for a.m. and p.m. vith actual synoptic charts. The SAWYER-MATHEWMAN (1951) method of application of SUTCLIFFE's equation is described. Then the situation on Nov. 9, 10 and 11, 1950 is described nd illustrated. Conclusion is that the field of relative divergence D is useful in accurately ocating the point where the secondary forms and its subsequent motion about 12 hours before he conventional method. *Subject Headings:* **1. Extended forecasting 2. Sutcliffe's method . Synoptic forecasting.**—*M.R.*

8.11–150 551.509.34

Farnham, D. L. and Gould, R. C., **Weather patterns and local forecasting at the Naval Ordnance Test Station, China Lake, Calif.** *U. S. Naval Ordnance Test Station, China Lake, Calif., NAVORD Report, 5267, NOTS 1480,* Oct. 16, **1956.** 30 p. 11 figs., numerous tables, 3 refs. **DWB**—A number of typical weather situations at China Lake, Calif. in relation to the ynoptic surface and 500-mb pressure patterns which usually accompany them. Study is

based on an analysis of weather at NOTS and charts for the Far West for Nov. 1948–Oc 1954. The specific situations are: strong westerly winds, strong northerly winds, trace c precipitation, measurable precipitation, slow moving systems, summer shower conditions an fair weather conditions. Rules for predicting these situations are set forth. *Subject Heading.* **1. Local forecast studies 2. China Lake, Calif.**—*M.R.*

8.11–151 551.509.5:519.

Gleeson, Thomas A., **On limitations to prediction.** *Journal of Meteorology*, 14(4):304–30 Aug. **1957.** fig., 2 tables, 7 refs., 14 eqs. **DWB**—An expression is obtained for the limit t certainty of perfect prediction, in terms of the amount of verification data and the detail of th predictand. Related expressions are developed for the number of effective predictors tha may be combined in a given prediction method, and for the fineness of predictand detail tha can be forecast. Applications to evaluation of practical forecast problems are discussed b use of examples. Similar treatments are suggested for specification problems. Because of th generality of their derivations, it is believed that these expressions would be useful in oth fields, as well as in meteorology. *Subject Headings:* **1. Forecast accuracy 2. Statistic analysis.**—*Author's abstract.*

WEATHER CONTROL

See: **Efficiency of ice forming seeding substances** (Sänger), 8.11–224.

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

ATMOSPHERIC POLLUTION

See also: **Cadbury-clean air pioneer** (Bailey), 8.11–40; **Frost protection by smoke screens** (Malkevich), 8.11–86; **Air pollution and public health** (Drinker), 8.11–109; **Atmos. pollution measurement** (Lawther), 8.11–139; **Atmos. chemistry** (Oddie), 8.11–223.

8.11–152 551.510.4

Bloomfield, Bernard D. (*Michigan Dept. of Health*), **Atmospheric pollution study of non-industrial area.** *American Industrial Hygiene Association, Quarterly*, 16(2):141–15 June **1955.** 12 figs., 10 tables, 2 refs. **DLC**—This atmospheric pollution study was mad in the St. Clair-Marine City area in the proximity of Detroit, Michigan. The exper mental technique is described and the data on concentration of atmospheric constituen are presented in tables and graphs. Particulate dust loadings approached levels determine in certain areas of Detroit, higher wind speeds result in lower particulate matter loading the predominant elements determined spectrographically were calcium, silicon, aluminum magnesium, lead, and iron; sulphur dioxide concentrations ranged from a minimum of 0.03 t 0.08 parts per million, etc. *Subject Headings:* **1. Atmospheric pollution studies 2. St. Clai Marine City area, Mich.**—*I.L.D.*

8.11–153 551.510.4

Pond, Richard L. and Paxton, R. R. (*Stanford Univ., Chem. and Chem. Engr. Dept Calif.*), **Water-containing jars and greased plates for dustfall measurements.** *Analytic Chemistry*, Wash., D. C., 27(5):714–716, May **1955.** 3 figs., 4 tables, 5 refs. **DLC**—In comparison of two methods for measuring fall out of dust from the atmosphere, cylindric glass jars partially filled with distilled water were exposed beside 5×10 in. glass plates coate with vaseline, on small platforms 18 ft above an open field. After exposure, the water fro the jars was analyzed for total solids, both soluble and insoluble. The grease and dust wer removed from the plates, using a petroleum ether-benzene solution, the resultant slurry w filtered through a sintered crucible, and hydrocarbon-insoluble dust was weighed in both a oven-dry and an ignited state. The standard deviation between concurrently exposed wat jars was 12.6%. The comparable value between greased plates was 6.8%. Thus the grease plate procedure gave more reproducible results and, with but one exception, slightly high dustfall rates. *Subject Heading:* **1. Dust fall measurement techniques.**—*Authors' abstract.*

STRUCTURE OF THE ATMOSPHERE

See: **Atmos. physics-emission phenomena** (Vassy), 8.10–1; **Model atmos.** (Mingner, Ripley), 8.11–10; **Standard atmos.** (U. S. W. B., U. S. A. F.), 8.11–11.

UPPER ATMOSPHERE—IONOSPHERE

See also: **Ionos. res., Alaska** (Colbert), 8.11–28; **Radio fading patterns** (Banerji), 8.11–275.

8.11–154 551.510.52/3:551.524.7

Furuichi, Masao, **Study of the tropopause over Yonago.** *Journal of Meteorological Research*, Tokyo, 6(8):339–346, Nov. **1954.** 2 figs., 8 tables, 7 refs. In Japanese; English summary p. 339. **DWB**—The present paper describes a research on the tropopause by means of aerological data taken at Yonago in 1951. The tropopause is defined as the level where the lapse rate of temperature is less than 2°C/km above 5 km, or the temperature is minimum, but the latter condition is valid only when an isothermal layer above the minimum temperature is thicker than 300–500 m. (1) The seasonal variation of tropopause height is shown in Table 1. A layer between the higher and lower tropopauses can be regarded as the subtratosphere after J. REGER. And the lower tropopause is observed at the level lower than the standard height decided by MR. Y. ISHIMARU. (2) The relation between the height of the lowest tropopause and the temperatures at 3 km and 7 km levels are shown in Fig. 1, which roughly indicates the direct proportion between the temperature of troposphere and the height of tropopause. (3) The temperature distribution in the layers above the tropopause are classified into 25 types as shown in Fig. 2, and Tables 4 and 5 can be obtained by combining 7 types of surface pressure patterns with each of the above-mentioned 25 types. A remarkable correspondence between temperature distribution and surface pressure pattern can be seen when a depression exists over the Sea of Japan. *Subject Headings:* **1. Tropopause variations 2. Tropopause height variations 3. Tropopause temperatures 4. Yonago, Japan.**—*From author's abstract.*

8.11–155 551.510.52/3(41)

*Priestley, Charles Henry Brian, **Characteristics of the tropopause over Southern England, 1944, with notes on the problem of forecasting in the "STRATO" chart.** *Great Britain Meteorological Office. Synoptic Division, Technical Memorandum*, No. 107, (1946?). 14 p. 10 tables, 4 figs. **DWB**—A year of radiosonde observations made at Larkhill, Eng. is analyzed and correlated in many ways to give a rough quantitative picture of the variations in the tropopause with changing seasons or meteorological changes. First the tropopause is defined (not always easy) and classified according to 3 types. The relation between tropopause height and temperature of the troposphere, or surface pressure or temperature is shown statistically and compared with Dines' values (from sounding balloon observations). Dines' correlations are usually much higher that those from 1944 soundings. Seasonal frequency distribution by 2000 ft height intervals, monthly, seasonal and annual mean values of all elements concerned and of ozone content, correlation coefficient between monthly means, changes or persistence of types, temperature at tropopause for various pressures, etc. shown in tables and graphs. No seasonal variation is found to be significant, but regression lines for pressure and temperature at tropopause both for Larkhill and Lerwick, show decided correlation, latitudinal and seasonal variations and even more marked in the correlation of height and temperature of tropopause with air mass temperature if the normal annual variation of temperature is first removed, since in the author's opinion this more nearly represents conditions at source of air mass. *Subject Headings:* **1. Tropopause variations 2. Larkhill, Eng. 3. Lerwick, Scotland.**—*M.R.*

8.11–156 551.510.534:550.3:06.13

Paetzold, Hans-Karl, **Das Internationale Geophysikalische Jahr, IX, Das atmosphärische Ozon.** [The IGY, Pt. 9, Atmospheric ozone.] *Umschau*, 57(17):532–534, Sept. 1, **1957.** 7 figs., 2 refs. **DLC**—Ozone distribution at Tromsö (70°N.) in spring and fall and on equator, and seasonal distribution in S. Germany, are shown to 40 km. Only above 30 km is the annual variation due to varying solar height; below this it is due to transport processes. The meri-

dional circulations in summer and winter hemispheres, and different types of vertical ozon distribution over Weissenau, are shown. The permanent maximum is at 23 km, secondar maxima at 16 and 5 km. Methods of measurement and the vertical circulation over high an low pressures are briefly described. Variations of total ozone at Weissenau are related to th incidence of subtropical and polar air masses. The world-wide ozone program of the IG is briefly sketched. *Subject Headings:* **1. Ozone layer 2. IGY program.**—*C.E.P.B.*

8.11–157 551.510.53

Ellis, G. R., **Measurement of the gyro-frequency in the *F* region.** *Journal of Atmospher and Terrestrial Physics*, 11(1):54–58, **1957.** 4 figs., table, 5 refs., 7 eqs. **DWB**—This pape describes a method of measuring the F-region gyro-frequency from *Pf* records, using th relation $fH = f_X - f_Z$. The observed values of the critical frequencies must be corrected fc errors arising from lateral deviation and horizontal gradients of critical frequency. It shown that the lateral deviations of the *O*, *X*, and *Z* modes, calculated with an approximat value of fH, and the observed values of f_X, f_O, and f_Z, provide sufficient information to obtai both the horizontal gradient of critical frequency and the gyro-frequency. The results of a analysis of *P'f* records obtained at Hobart, Tasmania, are given. It was found that at mean true height of 378 km, the mean gyro-frequency was 1.53 Mc/s, compared with an extr polated value, using ground parameters of 1.40 Mc/s. *Subject Heading:* **1. F layer gyro frequency.**—*Author's abstract.*

8.11–158 551.510.535:551.524.

Johnson, Francis S. (*U. S. Naval Res. Lab., Wash., D. C.*), **Temperature distribution the ionosphere under control of thermal conductivity.** *Journal of Geophysical Researc* Wash., D. C., 61(1):71–76, March **1956.** 2 figs., table, 12 refs., eqs. **DLC**—The effect thermal conductivity in controlling the temperature distribution of the high atmosphere considered. The energy absorbed in the F region is conducted downward into a denser regio of the atmosphere, where it is dissipated by infrared emission. The calculations indicate tha the atmosphere is isothermal above about 250 km, and that between 100 and 200 km there is very strong positive temperature gradient. The temperature in the isothermal region assumed to be 1100°K, in order to provide enough atmosphere near 300 km to support an F region. The low temperature at 80 km is due primarily to the lack of absorbed energy ther rather than to the presence of a strongly emitting layer at that level. *Subject Heading* **1. Ionospheric temperature distribution 2. Thermal conductivity of air.**—*Author's abstract.*

8.11–159 621.396.2:551.510.53

Jowett, J. K. S. and Evans, G. O., **A study of commercial time lost on transatlantic radi circuits due to disturbed ionospheric conditions.** *Institution of Electrical Engineers, Londo Proceedings, Pt. B*, 102(4):505–512, July **1955.** 6 figs., 11 refs. **DLC**—An analysis has bee made of the time lost on certain radio circuits incoming to the United Kingdom from Montre and New York during the period 1942–1952. The results have been examined in relatio to the variations in solar and magnetic activity with a view to estimating the degree of in terruption likely to be experienced on transatlantic circuits during the next few years. It i concluded that the maximum values of lost time occur during the winter months as the min mum of the sunspot cycle is approached, and that these high values are associated with period of high magnetic activity arising from the occurrence of M-region storms. It is considere that the adverse propagation conditions encountered since the winter of 1950–51 will be slightl less severe during the winter of 1954–55 and that by the winter of 1955–56 there should be marked reduction in the amount of commercial time lost on transatlantic circuits. *Subje Headings:* **1. Ionospheric propagation 2. Ionospheric disturbances.**—*Authors' abstract.*

8.11–160 551.510.535:551.594.1

Kallmann, H. K., **Electron distribution in a new model of the ionosphere.** Californi Univ. Institute of Geophysics. Contract AF 19(604)-111, Scientific Report, No. 4, Jan. 195 8 p. 4 figs.—A new model of the ionosphere, based on rocket data for electron densities rath than radio echo data, shows a more homogeneous ionosphere with the E, F1 and F2 regio merging gradually into each other rather than being widely separated or stratified. It ir

licates a heavy ionization in the 100–200 km region, and low electron density gradients at very low altitudes. The maximum of the F1 region would occur about 165 km. The discrepancy lies in the concept of virtual heights which may prove to be 50 to 100% too high owing to slight gradient variations in a supposedly thick ionosphere. *Subject Headings:* **I. Ionospheric models 2. Ionospheric electron density distribution 3. Virtual heights errors. I. California. Univ. Institute of Geophysics.**—*M.R.*

8.11–161 523.74:551.510.535

Taubenheim, J., **Über den Einfluss von Sonneneruptionen auf die ionosphärische *E*-Schicht.** [The influence of solar flares on the ionospheric E layer.] *Journal of Atmospheric and Terrestrial Physics*, 11(1):14–22, **1957.** 5 figs., 10 refs., 21 eqs. German and English summaries p. 14. **DWB**—The enhancements of E-layer critical frequency connected with sudden ionospheric disturbances are quantitatively discussed for a number of selected days. The increase of electron density lasts considerably longer than is deduced from the radio fadeout. A satisfactory estimate of the response of E-layer electron density to enhancements of the ionizing radiation is given by a solution of the ionospheric continuity equation for a very simple case. It follows that the observed variation of electron density is controlled decisively by the slow decrease of the radiation excess rather than by recombination. The magnitude of the enhancement of ionizing radiation can be calculated approximately. *Subject Headings:* **1. Solar flares 2. E layer disturbances.**—*Author's abstract.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

See: **Divergence** (Williamson), 8.11–146; **General circulation** (Lorenz), 8.11–168.

8.11–162 551.511.6

Grant, Alison M., **A corrected mixing-length theory of turbulent diffusion.** *Journal of Meteorology*, 14(4):297–303, Aug. **1957.** 3 figs., 10 refs., 15 eqs. **DWB**—The results of the conventional mixing-length theory do not agree with those of the statistical theory of turbulence. This is due to an implicit assumption in the mixing length theory that fluid parcels travel with infinite velocity over finite distances. When this inconsistency is removed, a "corrected" theory is reached; other sources of error are less important. The corrected theory is applied to diffusion of smoke from a cross-wind line source at ground level. *Subject Heading:* **1. Turbulent diffusion theory.**—*C.E.P.B.*

8.11–163 551.511.6

Peterson, Roy E., **Comparative studies of relative vorticities computed from geostrophic and observed winds.** *Journal of Meteorology*, 14(4):367–374, Aug. **1957.** 6 figs., 2 tables, 9 refs., 12 eqs. **DWB**—Fixed networks of rawinsonde stations were used to compute geostrophic relative vorticity from reported heights and observed relative vorticity from components of reported winds at 500 mb. The geostrophic vorticity was computed on the two different scales of 600 km and 300 km; the observed vorticity was computed on a 600 km scale. An analysis was made also of the vorticity variance produced by height errors, wind errors and small-scale wind fluctuations. Comparison of geostrophic vorticity on different scales indicates that grid size has a very important effect upon the computed value of geostrophic vorticity. Comparison of observed and geostrophic vorticity on the same scale shows some significant differences; many of these differences, however, can be explained by the effect of height and wind errors upon the computation of each vorticity. *Subject Heading:* **1. Vorticity.** —*Author's abstract.*

8.11–164 551.511.6

Schmitz, H. P., **Ein neuer Beweis des Theorems von H. Ertel über asynchron-periodische Wirbelbewegungen kompressibler Flüssigkeiten.** [New verification of H. Ertel's theory of asynchronous-periodic eddy motion of compressible fluids.] *Acta Hydrophysica*, Berlin, 3(3):147–155, **1956.** fig., ref., 12 eqs. **DLC**—Euler's equations can be used to prove Ertel's theorem on the relations between circulation, energy and period of asynchronous-periodic vortex motions, derived previously in the Lagrange form. Derivation is given in detail. *Subject Headings:* **1. Vortexes 2. Hydrodynamics 3. Ertel's vorticity theorem.**—*A.A.*

8.11–165 551.511.6:551.551.8

Spengos, A. C., **Turbulent diffusion of momentum and heat from a smooth, plane boundary with zero pressure gradient.** Colorado Agricultural and Mechanical College. Dept. of Civil Engineering, Contract AF 19(604)-421, Scientific Report, No. 1, Feb. **1956.** 50 p. 26 figs., 18 refs., 17 eqs. **DWB**—Detailed results of turbulence measurements made in a low speed wind tunnel, using a 10 ft×6 ft heated surface, hot wire anemometers to determine velocities and Reynolds stress distribution, thermocouples to determine temperatures, and electrical input to heated boundary to determine heat transfer. Equipment and collection of data are discussed and illustrated in first part of report and velocity and temperature profiles, drag coefficients and shear distribution, eddy diffusivity and relation between momentum and heat transfer in second part of report. Experimental results are given on scatter graphs in 22 pages of appendix. The mean velocity distribution for neutral stability or various lapse rates follows a modified rather than a pure logarithmic law and mean temperature and eddy diffusivity follow similar patterns. *Subject Headings:* **1. Turbulent diffusion experiments 2. Momentum-heat diffusion relationships 3. Heat diffusion 4. Wind tunnel experiments. I. Colorado. Agricultural and Mechanical College. Dept. of Civil Engineering.**—*M.R.*

GENERAL CIRCULATION

See also: **Genl. circulation as related to glacier retreat, Scandinavia** (Wallén), 8.11–62; **Jet stream speed** (Pauly, Menin), 8.11–121; **Numerical forecasting with barotropic model** (Gates), 8.11–142; **Surface circulation, Australasia** (Karelsky), 8.11–148; **Cold winters and warm summers in relation to general circulation** (Namias), 8.11–188; **Ice storm of Jan. 7–10, 1956, New Eng.** (McQueen, Keith), 8.11–225.

8.11–166 551.513:551.501.7

Bykov, V. V. and Mashkovich, S. A., **O kharakteristike zonal'noĭ tsirkuliatsii atmosfery.** [Characteristics of the zonal circulation of the atmosphere.] *Meteorologiia i Gidrologiia*, Leningrad, No. 2:3–9, Feb. **1956.** 3 figs., 6 tables, 8 refs., 4 eqs. **DWB, DLC**—The author develops an expression in which the index of zonal circulation is represented physically as the angular velocity of rotation of the atmosphere related to the earth and describes a procedure for calculating the index of zonal circulation and also for describing the velocity of west–east transport over any part of the Northern Hemisphere. Tables and graphs are presented giving the mean monthly values of the index of zonal circulation at 500 mb and 700 mb surface for each of six years, mean monthly index of zonal circulation at levels of 500, 700 and 1000 mb. and at different altitudes and the seasonal values of the index of circulation at different levels. The greatest intensity of zonal circulation is at the level between 10 and 13 km. West-east transport constitutes the predominant condition of the atmosphere at 19 km height during the cold season, while during the summer an opposite zonal circulation prevails. The annual variation of the zonal circulation is similar at all levels in the troposphere and lower stratosphere. *Subject Headings:* **1. Zonal circulation 2. Zonal index.**—*I.L.D.*

8.11–167 551.513:551.515

Hawkins, Harry F., Jr. (*Ext. Fore. Sec., U. S. W. B., Wash., D. C.*), **The weather and circulation of Sept. 1956, including a discussion of hurricane Flossy and September's typhoon tracks.** *Monthly Weather Review*, Wash., D. C., 84(9):336–342, Sept. **1956.** 7 figs., 19 refs. **DWB, DLC**—Hot weather in the Pacific Southwest, continued drought in the Great Plains, only one hurricane in the Caribbean and 6 typhoons in the Far East are among the notable features of the general circulation and attending weather in the Northern Hemisphere described and illustrated in this article. The easterlies were strong enough to give a great "hurricane probability" but fine structure necessary for full development of tropical storms in Atlantic and Caribbean were lacking. *Subject Headings:* **1. Hurricane "Flossy" (1956) 2. Typhoon case histories (1956) 3. Circulation patterns 4. Northern Hemisphere.**—*M.R.*

8.11–168 551.513:551.511

Lorenz, Edward N., **Basis for a theory of the general circulation.** (In: Massachusetts Institute of Technology. Dept. of Meteorology, Contract AF 19(122)-153, Studies of the Atmospheric General Circulation, Final Report, Pt. 1, May 31, **1954.** p. 522–534. 2 figs.,

13 refs.) **DWB**—General reasoning shows that the energy in the atmosphere flows from the environment to the zonal and the eddy available potential energy, and then to the eddy and zonal kinetic energy. Some of these transitions are still doubtful. Other hypothetical flow diagrams which might exist on other planets are explained. *Subject Headings:* **1. General circulation 2. Energy transfer.**—*A.A.*

8.11–169 551.513.1

Krueger, Arthur F. (*Ext. Fore. Sec., U. S. W. B., Wash., D. C.*), **The weather and circulation of July 1956, including some aspects of momentum flux in relation to an intense Polar vortex.** *Monthly Weather Review*, 84(7):271–276, July **1956.** 6 figs., 9 refs., 2 eqs. **DWB, DLC**—During July the prevailing westerlies shifted southward to a latitude more typical of May and this brought about below normal temperatures and frequent cyclonic activity. A description is given of the weather and circulation during July over the U. S. and over the other parts of the Northern Hemisphere and of the development of the July circulation. A mathematical analysis of the transfer of momentum at high latitudes with particular reference to the maintenance of the westerlies is presented. *Subject Headings:* **1. Angular momentum flux 2. Momentum transfer 3. Waves in the westerlies 4. Cyclonic activity 5. United States 6. Northern Hemisphere.**—*I.L.D.*

8.11–170 551.513.2:551.515:551.590.21

Glaser, Arnold H., **A possible sunspot influence on the general circulation.** *Journal of Meteorology*, 14(4):375–377, Aug. **1957.** 3 tables, 3 refs. **DWB**—Hemispheric wave number, 30–45°N, was counted each day 1946–47 at 500 mb and 1952–55 at 700 mb. Chi-square test applied to annual totals shows probability <1% that samples were drawn from a homogeneous population, <5% when every 7th day was selected to avoid persistence. Probabilities of transition from one wave number to another must also be inhomogeneous from year to year, and this is found to be so for wave number 6. Correlation between transition probability of wave number 6 and log of mean annual sunspot number is −0.955 for 6 pairs. *Subject Headings:* **1. Waves in the westerlies 2. Sunspot effects.**—*C.E.P.B.*

ATMOSPHERIC DISTURBANCES

See also: **Annual hurricane reports** (U. S. N. Fleet Weather Central), 8.11–16; **North Sea surges** (Charnock, Crease), 8.11–53; **Weather disasters** (Burney), 8.11–108; **Thunderstorm squall** (De et al.), 8.11–122; **Radar analysis of tornadoes** (Staats, Turrentine), 8.11–125; **Northwester forecasting** (Rai Sircar), 8.11–144; **Northwester forecasting** (Venkateswara Rao, Boothalingam), 8.11–145; **Surface circulation, Australasia** (Karelsky), 8.11–148; **Hurricanes and typhoons** (Hawkins), 8.11–167; **Sunspot effects on waves in the westerlies** (Glaser), 8.11–170; **Temp.-thunderstorm rainfall relationships** (Buell), 8.11–190; **Monsoon rainfall** (Pisharoty, Asnani), 8.11–240.

8.11–171 551.515.3(944)

Dunstan, R. R. (*Met. Office, Richmond, N.S.W.*), **Tornado, North Richmond, Feb. 20, 1956.** *Australian Meteorological Magazine*, Melbourne, No. 13:46–49, June **1956.** fig. **DWB**—A report of an unusual tornado-waterspout from 1049 to 1057a which occurred on Feb. 20, 1956 near the meteorological station at Richmond, N.S.W. It cut across a cornfield that had been flooded by previous deluge (path shown on chart). A newspaper photographer from Sydney flew over the area at the time of the tornado and gave an additional report of the waterspout and accompanying conditions (photo also reproduced). Cloud base was about 1500 ft. Path length about 1 mi. No damage occurred, but large amounts of water were sucked up into the vortex. Some lightning and very heavy rain was observed. *Subject Headings:* **1. Tornado, Richmond, N.S.W. (1956) 2. Richmond, New South Wales.**—*M.R.*

8.11–172 551.515.3:551.553.21:551.577.3(54)

George, P. A. (*Met. Off., Poona*), **Effects of off-shore vortices on rainfall along the west coast of India.** *Indian Journal of Meteorology and Geophysics*, 7(3):225–240, July **1956.** 18 figs., 5 refs. **DWB**—Formation and dissipation of small scale circulations and vortices take place incessantly along the west coast of India, during the monsoon season. Some of these vortices are found to develop into significant shape and size and make noteworthy contributions

towards rainfall along the west coast. The occurrence of rainfall relatively heavier over the coastal stations away from the ghats than over sections close to the ghats is not an uncommon feature. This peculiar distribution of rainfall is found to occur under the influence of off-shore vortices. These vortices are of the order of 30 to 100 mi in horizontal extent. They generally move northwards parallel to the ghats. The variations of surface winds experienced at the stations provided with autographic records reveal that there are a few significant points connected with all well-developed vortices, and that the rainfall associated with a vortex is usually heaviest between the "core" region and the "confluent" region of the vortex. *Subject Headings:* **1. Off-shore vortexes 2. Rainfall distribution 3. Monsoon rainfall 4. India.**—*Author's abstract.*

8.11–173 551.515.3(261.3)

Pichner, B. and Rodewald, M., **Windhosen bei Gotland.** [Waterspouts near Gotland.] *Wetterlotse*, No. 122:193–195, Sept. **1957. DLC**—Pichner reports 5 waterspouts on July 27, 1957, in 56°58′N, 19°42′E from 1634 to 1645, during passage of a CuNb associated with a cold front. Rodewald comments that it was a secondary cold front and asks why this particular one produced spouts. *Subject Headings:* **1. Waterspouts 2. Baltic.**—*C.E.P.B.*

RADIATION AND TEMPERATURE

RADIATION

See also: **Atmos. physics-emission phenomena** (Vassy), 8.11–1; **Solar elec. power stations,** 8.11–106; **Twilight effects on sferics** (Abbott), 8.11–126.

8.11–174 551.521.12(68)

Drummond, A. J. and Vowinckel, E., **The distribution of solar radiation throughout southern Africa.** *Journal of Meteorology*, 14(4):343–353, Aug. **1957.** 5 figs., 7 tables, 22 refs. **DWB**—Since 1950 about 30 stations have been established for solar radiation measurements in S. Africa (map); results are published in **Quarterly Radiation Bulletin** (Pretoria). Maps are given of total solar radiation on a horizontal surface in winter (June-Aug.) and summer (Dec.-Feb.) and discussed. Meridional cross sections along 20° and 30°E of extraterrestrial and surface radiation, sunshine duration and height a.s.l., and isopleths of monthly radiation between 25° and 30°E, are shown. Distributions of diffuse (sky) radiation and diurnal variation are given for 10 or 11 stations. *Subject Headings:* **1. Solar radiation distribution 2. South Africa.**—*C.E.P.B.*

8.11–175 551.521.16:546.33

Donahue, T. M. (*Univ. of Pittsburgh*), **A calculation of the sodium dayglow intensity.** *Journal of Geophysical Research*, Wash., D. C., 61(4):663–666, Dec. **1956.** 2 figs., 3 refs. **DLC**—A calculation of the resonance scattering from a sodium layer between 70 and 100 km for all daylight angles of solar depression is presented. Observations at zenith distance zero and in a plane perpendicular to the sun are considered. The calculation is based on a previous computation of the density of sodium excited by the sun. The effect of absorption in the sodium layer is taken into account. The intensity rises by a factor of about 5 from sunset to noon for a layer 2×10^{11} cm^{-2} thick and by about 27 for a layer only 2×10^{9} cm^{-2} thick. *Subject Headings:* **1. Dayglow 2. Sodium emission.**—*Author's abstract.*

8.11–176 551.521.3:551.576

Feĭgel'son, E. M., **Pogloshchenie solnechnoĭ energii v atmosfere pri nalichii oblakov.** [Absorption of solar energy by the atmosphere in the presence of clouds.] *Akademiia Nauk SSSR, Geofizicheskiĭ Institut, Trudy*, No. 23(150):65–91, **1954.** 7 figs., 9 tables, 8 refs., 74 eqs. **DLC**—The author attempts to evaluate theoretically the changes in the distribution of solar energy in the atmosphere brought about by clouds. The clouds are considered as homogeneous, infinite, horizontal layers containing water vapor and water droplets of known density. The droplet character of the water is taken into account by introducing a large coefficient of scattering corresponding to theoretical calculations and given observations. A calculated

example is given of the absorption of solar energy at different levels in the presence of cloudiness of given thickness, scattering and absorbing solar energy. *Subject Headings:* **1. Cloud effects on atmospheric absorption 2. Atmospheric absorption.**—*I.L.D.*

8.11–177 551.521.3

Herovanu, M., **Neue Methoden zum Studium der Strahlungsdiffusion in der Atmosphäre.** [New methods of studying radiation diffusion in the atmosphere.] *Zeitschrift für Meteorologie*, 11(2):33–40, Feb. **1957.** 3 figs., 4 tables, 8 refs., 18 eqs. German and French summaries p. 33. **DLC**—The relations of the Mie formula for the coefficient of extinction by diffusion to the Ångström formula are established and Ångström's exponent α is calculated for different wave lengths for droplets of the same and different radii. Ångström's is found to be a simple expression to which all formulas expressing the coefficient of extinction can be brought. A graphical method of calculating α and β in Ångström's expression for the extinction coefficient of atmospheric aerosol is described. A diagram gives a simple method of determining whether diffusion can be expressed by MIE's law; if so the radius and concentration of the droplets can be deduced. *Subject Headings:* **1. Radiation calculations 2. Ångström formula.**—*C.E.P.B.*

8.11–178 551.521.326:535.33

Bates, D. R. and Moiseiwitsch, B. L., **On the remarks of V. I. Krassovsky regarding the O_3 and O_2 hypotheses of the OH airglow.** *Journal of Atmospheric and Terrestrial Physics*, 11(1):68–70, **1957.** 14 refs., 2 eqs. **DWB**—State that V. I. KRASOVSKII's claim (*Journ. Atm. Terr. Phys.*, 10(1):49–51, Jan. **1957,** *see* 8.6–225, June 1957, *MAB*) that Meinel hydroxyl emission originates from 100 km level is unjustified. The excitation of 10th vibrational level of OH by $O_3+H \rightarrow O_2+OH$ depends mainly on photo-dissociation deep in the atmosphere. *Subject Heading:* **1. Night airglow spectrum.**—*C.E.P.B.*

8.11–179 551.521.61:534.343

Kaplan, Lewis D. and Eggers, David F., Jr., **Intensity and line-width of the 15-micron CO_2 band, determined by a curve-of-growth method.** *Journal of Chemical Physics*, 25(5):876–883, Nov. **1956.** 2 figs., 5 tables, foot-refs., 20 eqs. **DLC.** Also issued (in reprint) as Institute for Advanced Study, Princeton, N. J. Contract Nonr-1358(01), Technical Report, No. 4.—The intensity of the 15μ band of CO_2 has been redetermined by a curve-of-growth method, utilizing simple formulas derived for the absorption coefficient of the Q branch. The value obtained is 240 cm^{-1} per cm at S.T.P., some 25 to 30% higher than the results of the Wilson-Wells method. Extrapolation methods in general can lead to considerable underestimation of intensity, especially when applied to bands containing narrow Q branches. The nitrogen-broadened half-width at one atmosphere and 298K is 0.064 cm^{-1}. *Subject Headings:* **1. Atmospheric composition 2. Carbon dioxide spectrum.**—*Authors' abstract.*

8.11–180 551.521.61:551.578.46

*Kojima, Chuzaburo, **Measurement of thermal radiation from the snow surface by a trial manufactured radiometer.** *Seppyo* (*Snow and Ice*), Tokyo, 16(1):22–27, Sept. **1954.** 2 tables, 3 figs., eqs. In Japanese. **DWB**—Instrument calibration curve and installation of equipment described and illustrated and data obtained hourly from 18 h to 24 h on 4 days in Feb. and March are presented in table and discussed. Daytime radiation data obtained on 7 days in Feb. and March are also tabulated in detail. *Subject Headings:* **1. Radiation from snow cover 2. Radiometers 3. Japan.**—*M.R.*

8.11–181 551.521.63:535.33

Johnson, F. S.; Purcell, J. D.; Tousey, R. and Wilson, N. (*U. S. Naval Res. Lab., Wash., D. C.*), **The ultraviolet spectrum of the sun.** (In: Boyd, R. L. F.; Seaton, M. J. and Massey, H. S. W. (*eds.*), **Rocket exploration of the upper atmosphere.** London, Pergamon, **1954.** p. 279–288. 10 figs., 12 refs.) **DWB**—Solar ultra-violet spectra are of interest both to the solar and terrestrial physicist. This paper discusses the Naval Research Laboratory results using a 40-cm concave giving rocket-borne spectrograph. Highly resolved spectra were obtained to 2100Å, and traces of the spectrum extended to 1700Å. It is noted that no absorption by rare atmospheric constituents (other than ozone) has been found. Curves of the absolute solar intensity distribution are presented from 2200Å to 3 microns. The absolute

energy scale is based on a solar constant of 2.00 cal-cm^{-2}-min^{-1}, which is the best value resulting from a reconsideration of the data of the Smithsonian Institution. *Subject Headings:* **1. Ultraviolet spectrum 2. Rocket-borne spectrographs 3. Solar constant.** —*Authors' abstract.*

8.11–182 551.521.64

Clark, G.; Earl, J.; Kraushaar, W.; Linsley, J.; Rossi, B. and Scherb, F., **An experiment on air showers produced by high-energy cosmic rays.** *Nature*, London, 180(4582):353–356, Aug. 24, **1957.** 7 figs., 3 refs., eq. [**Pt. 2**] *Ibid.*, 180(4583):406–409, Aug. 31, **1957.** 3 figs., 2 refs., 8 eqs. **DWB**—Particles of very high energy are rare and the only approach is the study of giant showers. Since July 1955 these have been investigated at Cambridge, Mass., with detectors arranged over a circular area 460 m diameter. A preliminary account of results to date is given. The largest shower recorded had 1.4×10^9 particles and came at a zenith angle of 11°. There is no tendency for small showers to cluster about the galactic plane but more showers exceeding 3×10^7 particles were recorded close to the galactic plane than from near the north galactic pole. There is no marked dependence of lateral distribution on size or zenith angle. The continuation of Aug. 24, p. 353–356, deals first with the integral size of spectrum and atmospheric absorption. Conversion of the size spectrum into an energy spectrum of primary cosmic ray particles is then discussed and the results of several experiments are combined. The spectrum of primary cosmic rays extends unbroken from 10^9 to 10^{18} eV; and this bears on the structure of the galaxy. *Subject Heading:* **1. Cosmic ray showers.** —*C.E.P.B.*

8.11–183 551.521.64:551.508.25

Cranshaw, T. E. and Galbraith, W., **Observations on extensive air showers, Pt. 1 2.** *Philosophical Magazine*, 8 ser., 2(18):797–810, June **1957.** 8 figs., 2 tables, 18 refs. **DWB**—**Pt. 1, Apparatus,** describes a lattice arrangement of 91 sets of 3 Geiger-Müller counters covering ½ km^2 set up near Harwell. Circuits are shown. Rate at which showers arrive is recorded every hour, solar and sidereal time, by a bank of Post Office registers. Pt. 2, **Time variations in the energy region of 10^{17}eV,** describes rates of arrival of extensive air showers over nearly 2 years. Results show no evidence for any variation in sidereal time but a marked semidiurnal variation. Times of minimum rate coincide with pressure maxima but this is not the explanation. *Subject Heading:* **1. Cosmic ray showers.**—*C.E.P.B.*

8.11–184 551.521.64:551.543

Lockwood, J. A. and Calawa, A. R., **On the barometric pressure coefficient for cosmic-ray neutrons.** *Journal of Atmospheric and Terrestrial Physics*, 11(1):23–30, **1957.** 6 figs., 7 refs., 2 eqs. **DWB**—Barometric pressure at Mt. Washington, uncorrected and corrected for wind velocity, was compared with cosmic ray neutron intensity 1954–55. Corrected pressures measured true air mass over the detector to ±0.05 in. Hg. Uncorrected pressures did not agree with previously reported values. Relation of pressure correction to wind speed is $\Delta c=\frac{1}{2}\rho V^2$. Pressurized barometer reading is a measure of average air mass over nucleonic detector at Mt. Washington. The pressure correction is one of the largest sources of error in studying primary cosmic ray time variation. *Subject Headings:* **1. Cosmic ray variations 2. Pressure change effects 3. Mt. Washington, N. H.**—*C.E.P.B.*

TEMPERATURE

See also: **Frost protection by sprinkling** (Burckhardt), 8.11–85; **Frost protection by smoke screens** (Malkevich), 8.11–86; **Frost prevention** (Schmitt), 8.11–87; **Air temp. measurement in a wood** (Baumgartner, Hofmann), 8.11–91; **Temp. effects on insects** (Rudinsky, Kite), 8.11–94; **Temp. measurement in seed beds** (Silen), 8.11–97; **Winter weather, U. S., 1955–56** (Ludlum), 8.11–128; **Record low temps.** (Ludlum), 8.11–129; **Spring frosts** (Kallós), 8.11–147; **Tropopause temp.** (Furuichi), 8.11–154; **Ionos. temp. distribution** (Johnson), 8.11–158; **Radiation fog** (Urfer), 8.11–229.

8.11–185 551.524:519.241.1(421)

Craddock, J. M., **The serial correlations of daily mean temperatures at Kew Observatory, Great Britain.** *Meteorological Research Committee, M.R. Papers*, 1023, Dec. 31, **1956.** 9 p.

2 figs., 21 tables, 6 refs., 6 eqs. Mimeo. **DWB**—Serial correlations were computed between Kew temperatures on each day 1900–1950 and following 7 days. Results and S.D.'s are plotted. Mean S. D. varies from 2.33°C in Aug. to 3.40 in Jan. Mean correlation coefficients ranged from 0.7641 after 1 day to 0.1810 after 7 days; they are also given in terms of Fisher's z. Serial values are not independent and are used to divide the year into natural seasons. A statistical forecasting method is tried, and a number of regression equations using up to 4 preceding days are presented, but the results do not equal synoptic forecasts. Five-day non-overlapping periods are also tried, with moderate success. *Subject Headings:* **1. Temperature correlations 2. Kew Observatory, Eng.**—*C.E.P.B.*

8.11–186 551.524.3:519.241.6

Jenkinson, A. F., **Relations between standard deviations of daily, 5-day, 10-day and 30-day mean temperatures.** *Meteorological Magazine*, London, 86(1020):169–176, June **1957.** 3 figs., 5 tables, 2 refs., 5 eqs. **DWB**—Standard deviations of mean daily, 5, 10 and 30 day temperature means were computed for 10 widely distributed stations and σ_5, σ_{30} for 4 more, for Jan., April, July and Oct. Relations found were $\sigma_1 = 2.03\ \sigma_{30}$, $\sigma_5 = 1.62\ \sigma_{30}$, $\sigma_{10} = 1.31\ \sigma_{30}$. Seasonal and regional variation is discussed. The values are shown to agree reasonably with theoretical values having some degree of autocorrelation. *Subject Headings:* **1. Temperature variations 2. Standard deviations.**—*C.E.P.B.*

8.11–187 551.524.35:633.18:632.1(52)

Arakawa, H., **Three great famines in Japan.** *Weather*, 12(7):211–217, July **1957.** 6 figs., 9 refs. **DWB**—Rice, the staple diet, is tropical in origin and in N. Japan the crop is marginal and liable to failure in cold summers. There were great famines in 1782–1787, 1833–39 and 1866–69, which imposed a severe check on population. Prices rose. The low temperatures were world wide; causes are discussed. *Subject Headings:* **1. Cool summers 2. Rice crop 3. Famines 4. Japan.**—*C.E.P.B.*

8.11–188 551.524.35(485):551.513.7

Namias, Jerome, **Characteristics of cold winters and warm summers over Scandinavia related to the general circulation.** *Journal of Meteorology*, 14(3):235–250, June **1957.** 20 figs., 20 refs. **DWB**—Increased continentality in 1955 in northern Europe was shown up in Swedish records. Stockholm's seasonal temperature anomalies are related to 700 mb departures from normal, not only local but general. Latitude of observed subpolar minimum in m.s.l. pressures was found for each month, 1899–1939, and mean winter and summer positions computed. Curves smoothed over 5 years agree with long period trends in Stockholm temperature. This is due in winter to displacement of storm tracks by blocking anticyclones when circumpolar westerlies are low. In summer upper level anticyclonic belt is displaced far to the north. Average profile anomalies for 700 mb, 0–180°W, for cold and warm winters and summers in Stockholm show relations clearly. Strong high latitude westerlies in summer tend to be followed by weak westerlies in the following winter, and *vice versa*; an explanation is given. Relations between continentality at Stockholm and Zonal Index are discussed. *Subject Headings:* **1. Temperature anomalies 2. Stockholm, Sweden.** *C.E.P.B.*

8.11–189 551.524.4:551.575.1(798)

*Robinson, Elmer and Bell, Gordon B., Jr. (*both, Stanford Res. Inst., Menlo Park, Calif.*), **Low-level temperature structure under Alaskan ice fog conditions.** *American Meteorological Society, Bulletin*, 37(10):506–513, Dec. **1956.** 10 figs., 8 refs. **DWB**—Wiresonde temperature soundings were taken during two winters at Eielson Air Force Base, near Fairbanks, Alaska, as part of an ice fog investigation. Correlations were found between the depths of the visible fog layers and the steep portions of the temperature inversions. The steep portions of the temperature inversions were usually confined to the lowest 100 feet of the atmosphere. The frequency of occurrence of strong surface inversions was less than had previously been expected for an arctic continental area with temperatures in the vicinity of −40°C. This is attributed to the modifying effect of the ice fog, which was usually present in the observation area at temperatures below −30°C. *Subject Headings:* **1. Ice fog 2. Inversion effects on ice fog 3. Surface inversions 4. Wiresonde data 5. Eielson Air Force Base, Alaska.**—*Authors' abstract.*

8.11–190 551.524.7:551.515.42:551.577

Buell, C. Eugene (*Univ. of New Mexico, Albuquerque*), **The relation between the temperature differences between the 700-mb and 500-mb levels and thunderstorm rainfall.** *American Meteorological Society, Bulletin*, 35(10):476–477, Dec. **1954.** table, 4 refs. **MH-BH**—The rainfall index, which represents the rain falling over an area, is expressed by the equation $y=\bar{y}+a(x_1-\bar{x}_2)+b(x_2-\bar{x}_2)+c(x_3-\bar{x}_3)$ where $y=\log(1+I)$ = rainfall under x_1 = mixing ratio at 700-mb, x_2 = mixing rate at 500 mb, x_3 = temperature difference between 700 mb and 500 mb, $\bar{y}$, $\bar{x}_1$, $\bar{x}_2$, $\bar{x}_3$ = means of respective quantities, a, b, c = coefficients determined from the data, $I=(1000/N)\Sigma(r/R)$ where r = station rainfall for the day, R = station mean rainfall for the month, N = number of stations reporting. Using this equation, the author found that the rainfall and 700 mb–500 mb temperature difference are negatively correlated when applied to New Mexico data. A similar relationship was found for summer thunderstorms in southern Florida. It is conjectured that this relationship may be characteristic of some nonfrontal summer thunderstorms. *Subject Headings:* **1. Temperature-precipitation relations 2. Thunderstorm rainfall 3. Rainfall index 4. New Mexico 5. Florida.**—*I.L.D.*

SOIL TEMPERATURE

See also: **Soil temp. measurement in a wood** (Baumgartner, Hofmann), 8.11–91.

8.11–191 551.525:536.21

Rider, N. E., **A note on the physics of soil temperature.** *Weather*, 12(8):241–246, Aug. **1957.** 2 figs., 2 tables, 5 refs. **DWB**—Meteorologically, it is soil heat content rather than temperature which is important. Conductivity λ increases rapidly at first with addition of water, and then shows little change. Heat capacity ρc shows a steady increase and thermal diffusivity $K=\lambda/\rho c$ has a maximum at moisture content $<10\%$. Variation of K with depth is discussed. Bare soil reaches higher temperatures than grass during the day and stores up more heat which may offset an inversion at night. Meteorological Office mercury-in-glass earth thermometers are compared with Cambridge thermoelectric. *Subject Heading:* **1. Soil temperature physics.**—*C.E.P.B.*

PRESSURE AND WIND

PRESSURE

See also: **Atmo. tides** (Kerts), 8.11–9; **Semidiurnal pressure waves, Arctic** (Haurwitz, Sepúlveda), 8.11–27; **Pressure coefficient for cosmic rays** (Lockwood, Calawa), 8.11–184; **Lee waves** (Wallington, Portnall), 8.11–202.

8.11–192 551.543.3(261)

Rodewald, M., **Die "Jahrestendenz" 1957.** [The annual tendency, 1957.] *Wetterlotse*, No. 122:188–190, Sept. **1957.** 2 figs., 2 tables. **DLC**—Since 1947 there has been a 2 year oscillation in weather and pressure in North Atlantic and Europe, but this failed in June 1957. *Subject Heading:* **1. Pressure periodicities.**—*C.E.P.B.*

8.11–193 551.547.2

Heastie, H., **Average height of the standard isobaric surfaces over the temperate and tropical regions in January.** *Great Britain, Meteorological Research Committee, M.R.P.*, 1045, March 28, **1957.** 8 p. 11 charts, 8 refs. **DWB**—This paper extends the author's north polar charts for 1949–53 to 60°S. Method of construction from upper wind data and thickness charts is described. Average Mercator charts for 700, 500, 300, 200, 150 and 100 mb levels, and intervening thicknesses, are given and discussed. *Subject Heading:* **1. Standard isobaric surfaces.**—*C.E.P.B.*

8.11–194 551.547.5:550.384

Mironovitch, V., **Les pôles de la circulation atmosphérique générale et les pôles magnétiques terrestres.** [The poles of general atmospheric circulation and the geomagnetic poles.] *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 29(2):123–128, **1956.** 4 figs., 9 refs.

German, English and French summaries p. 123. DWB—If one compares the normal winter topography of the 300 mb surface with the mean field of the geomagnetic elements (both fields represented by new data) one notices a great similarity between these two fields. In particular, the two centers of cyclonic circulation, over the Canadian Archipelago and over Cape Chelyuskin (Siberia), coincide well with the two geomagnetic poles. (The existence of the second pole has been demonstrated by Russian geomagnetic observations.) Furthermore, some phenomena are mentioned which indicate the connection between geomagnetic and purely meteorological phenomena. The origin of this connection remains obscure. *Subject Headings:* **1. Geomagnetic poles 2. Upper air pressure distribution.**—*Author's abstract.*

WIND

See: **Tailwinds, Indian air routes** (Bedekar), 8.11–75.

TURBULENCE

See also: **Turbulence effects on airplanes** (Eggleston), 8.11–73; **Turbulence measurement** (Wise), **8.11–132; Turbulent diffusion experiments** (Spengos), 8.11–165.

8.11–195 551.551:531.3

O'Brien, Vivian, [**Comments on**] **V. C. Liu: Turbulent dispersion of dynamic particles. Reply by Liu.** *Journal of Meteorology*, 14(4):379–380, Aug. **1957.** 6 refs., 2 eqs. **DWB**—O'Brien criticizes V. C. Liu (*J. of Met.*, 13(4):399–405, Aug. **1956,** *see* 7.11–218, Nov. 1956, *MAB*) on the ground that the analysis applies only to particles smaller than any eddy size contributing appreciably to the total velocity fluctuation. In general a solid particle will slip away from its initial fluid envelope and follow a mixed Lagrangian-Eulerian course. Liu rejects this criticism on the ground that the correlation function should be defined in the Lagrangian sense. When particle displacement is small compared with energy-containing eddies of turbulence this is approximately equal to correlation at a fixed point. *Subject Headings:* **1. Turbulent dispersion of particles 2. Particle dynamics.**—*C.E.P.B.*

8.11–196 551.551:533.6

Taylor, R. J., **Space and time correlations in wind velocity. Reply by Frank Gifford, Jr.** *Journal of Meteorology*, 14(4):378–379, Aug. **1957.** 3 refs. **DWB**—Referring to F. Gifford, Jr. (*J. of Met.*, 13(3):289–294, June **1956**; *see* 7.10–200, Oct. 1956, *MAB*) Taylor states that $(1-R)$prop $t^{\frac{1}{3}}$ gives a better fit for Eulerian autocorrelations than a linear relation. Gifford agrees. *Subject Headings:* **1. Turbulence theory 2. Brookhaven, N. Y.**—*C.E.P.B.*

8.11–197 551.551.2:551.501

Dryden, Warren A., **Effects of the scale of spatial averaging on the kinetic energies of small-scale turbulent motion.** *Journal of Meteorology*, 14(4):287–292, Aug. **1957.** 14 figs., 6 refs., 8 eqs. **DWB**—Particles in a field of 80×80×50 cm were photographed. Field of motion was divided into volumes of 4 different sizes from 10×10×50 to 40×40×50 cm and mean motion and eddy energy computed for each. Mean motion plots show a vortex with maximum speed at the center, but decreasing with increasing scale. The mean kinetic energy of eddy motion increased with increasing scale. The scale of averaging the velocity components has a considerable effect on the character of analysis of mean motion. *Subject Heading:* **1. Turbulence scale.**—*C.E.P.B.*

WIND DISTRIBUTION AND VARIATION

See also: **Thunderstorm squall** (De et al.), 8.11–122; **Effects of off-shore vortex on precip.** (George), 8.11–172.

8.11–198 551.552:629.132.3

†Lee, James M., **A review of air-flow visualization by means of mist, smoke, and dust.** *U. S. David W. Taylor Model Basin, Caderock, Md., AERO Report* 883, Oct. **1955.** 32 p. 11 figs. (incl. photos), 3 refs., bibliog., p. 17–21. **DWB**—The history of the use of smoke or mist in visualization of air flow in wind tunnels is reviewed, and the equipment, methods, problems

and facilities used by the David Taylor Model Basin in past years, described and illustrated. Actual experiments are also illustrated photographically and diagramatically. A chronologically arranged bibliography of 56 items (1910-1953) is appended. *Subject Headings:* **1. Air flow visualization 2. Wind tunnel experiments 3. Smoke tracers.**—*M.R.*

WIND EFFECTS

See also: **Wind and wind-breaks** (Javadi), 8.11–8; **Wind break effects on weed dispersal** (Illner), 8.11–89; **Wind power utilization, India** (Nilakantan), 8.11–103.

8.11–199 551.556.2:63

Gloyne, R. W., **Problems of surface air-flow and related phenomena in agriculture, horticulture and forestry.** *Great Britain. Meteorological Research Committee, M.R.P.*, 1049, 8th April **1957.** 11 p. 17 refs. Mimeo. **DWB**—Problems of wind breaks in relation to heat losses from glasshouses, wind and climatic hazards to forestry and agriculture, are discussed. Risk of smoke or dust deposits, disease spores and snow is considered. Wind surveys, ecological data, and studies of topography and obstructions are all necessary, but there are large gaps in our knowledge. A program of investigations is laid down, including general wind field over British Isles, topographical influences on air flow, effect of types of roughness elements, and "exposure." *Subject Headings:* **1. Wind effects 2. Agricultural meteorology.** —*C.E.P.B.*

8.11–200 551.556.2:533.607

Trienes, H., **Windschutzhecken im Windkanal.** [Wind shelter hedges in a wind tunnel.] *Meteorologische Rundschau*, 10(3):88–93, May/June, **1957.** 14 figs., 10 refs. **DWB**—A wind break should decrease velocity near the ground and increase crop yield by 10–20% or more. The best hedge has a permeability of 50%. Wind velocities are shown in a wind tunnel at different distances behind a plank wall, solid and with different numbers of holes 5 mm in diameter. The geometric permeability does not differ much from the aerodynamic permeability. Models of houses without and with hedges were also tested in the wind tunnel. Evaporation from soil under different conditions of relative humidity, wind and soil humidity, as modified by different hedge models, was also examined. *Subject Headings:* **1. Wind protection 2. Wind tunnel experiments.**—*C.E.P.B.*

8.11–201 551.556.4:551.311.31

*Yamashita, I., **Experiment on sand-grains accumulated around obstacles.** *Journal of Meteorological Research*, Tokyo, 7(5):295–304, July **1955.** 10 figs. In Japanese; English summary p. 295–296. **DWB**—Detailed wind tunnel tests were made to show the mechanism of sand accumulation or movement around a rectangular obstacle with varying height, varying wind speed, type of sand and type of floor. It was shown that there is a wind speed below which sand does not move (3.2 to 3.7 m/sec) depending on type of sand and consequent friction on floor. By varying the angle of tilt of the floor boards the coefficient of static friction and coefficient of kinetic friction was determined, according to angle when sand began to slide and angle when sand ceased sliding. Wind flow over and around obstacle and sand accumulation was studied and the characteristics shown graphically. The obstacle itself reduces the wind speed and alters the accumulation parameters as it grows. *Subject Headings:* **1. Sand accumulation behind obstacles 2. Wind flow around dunes 3. Wind tunnel tests.**—*M.R.*

UPPER AIR WINDS

See: **Upper air wind measurement** (Giles, Peterson), 8.11–120; **Jet stream speed** (Pauly, Martin), 8.11–121; **Radar winds** (Harper, Beimers), 8.11–232.

VERTICAL MOTION

8.11–202 551.558.21:551.541

Wallington, C. E. and Portnall, Janet, **A numerical study of the wavelength and amplitude of lee waves.** *Great Britain. Meteorological Research Committee, M.R.P.*, 1025, 2nd

Jan. 1957. 7 p. 4 figs., 3 refs., 11 eqs. Mimeo. **DWB**—The wave length of lee waves was calculated by high speed computing, with artificial boundary assumptions at the upper limit of the layer considered. Results were compared with radiosonde ascents at Leuchars. The amplitudes of the calculated waves differ greatly according to upper boundary conditions but compact groups of curves without large curvature at high levels are interpreted as real waves and agree more or less with observed waves. Estimated vertical speeds were reasonably consistent with observed vertical speeds. *Subject Heading:* **1. Lee waves.**—*C.E.P.B.*

AQUEOUS VAPOR, HYDROMETEORS AND HYDROMETEOROLOGY

HUMIDITY

See: **Forest effects on humidity** (Mařan), 8.11–92; **Homogeneity of humidity data** (Saito), 8.11–134.

EVAPORATION

See also: **Evaporation, Valentia** (Guerrini), 8.11–6.

8.11–203 551.573:551.577.52:634.9

†Bleasdale, A., **Afforestation of catchment areas: the physicist's approach to problems of water loss from vegetation.** *Empire Forestry Review*, 36(1):59–66, **1957.** 19 refs. **DA**—Much literature is discussed, especially by J. Grunow and H. L. Penman. Loss of water by interception-evaporation is largely or entirely compensated by fog-drip from trees. Afforestation also provides best control over surface runoff and erosion on heavy soils. Penman's aerodynamic and heat balance methods of estimating evaporation are discussed. Planting of trees introduces factors that dark green foliage will absorb more of incoming radiation than a lighter green, and individual trees and plantations destroy assumption of a smooth level surface. Effect of wind breaks is also discussed. *Subject Headings:* **1. Forest influences 2. Water losses from vegetation.**—*C.E.P.B.*

8.11–204 551.573

Heigel, Karl, **Ergebnisse von Verdunstungsmessungen mit Piche-Evaporimetern, ihre Abhängigkeit von einigen meteorologischen Faktoren und von verschiedenen Standorten.** [Results of evaporation measurements with Piche evaporimeters, their dependence on some meteorological factors and on different locations.] *Meteorologische Rundschau*, 10(3):101–107, May/June **1957.** 9 figs., 5 tables, 7 refs. **DWB**—Observations of evaporation at Hohenpeissenberg in 1954–1956 at 0.5 and 2 m with Piches in the open, a screen and a wind tunnel are compared with saturation deficit, ventilation and sunshine duration. Evaporation in screen was 63% of that in the open. Evaporation, especially in the open at 2 m, shows a remarkable unexplained slackening at 6–8 a.m. Relations to sunshine duration are explained by relations of polar maritime, and of continental, sub-tropical and mixed air, to turbidity. Influence of locality is then discussed; at 2 m evaporation was much greater in an open meadow than in a "normal" exposure or in the screen. Evaporation is then compared at 0.5, 1.2 and 2.0 m in 1954. If 2 m is 100 m, meadow is 117%, 1.2 m 84% and 0.5 m 69%. *Subject Headings:* **1. Evaporation measurements 2. Hohenpeissenberg, Germany.**—*C.E.P.B.*

8.11–205 551.573:551.577.53:634.9

Laurie, M. V., **The effect of forests in water catchment areas on the water losses by evaporation and transpiration.** *Empire Forestry Review*, 36(1):55–58, **1957.** 7 refs. **DA**—Factors influencing transpiration from different types of vegetation, and economics of runoff, are discussed. Difficulties of comparing rainfall and runoff on 2 comparable areas, one forested, the other not, are set out. *Subject Headings:* **1. Forest hydrology 2. Water losses from vegetation.**—*C.E.P.B.*

8.11–206 551.573:551.579

Philip, J. R., **Evaporation, and moisture and heat fields in the soil.** *Journal of Meteorology*, 14(4):354–366, Aug. **1957.** 14 figs., 58 refs., 41 eqs. **DWB**—Considers evaporation from drying bare soil. There are 3 stages: 1. So long as soil is moist, evaporation rate E resembles that from a saturated surface E_s. 2. At intermediate moisture content E depends only on soil moisture distribution. 3. When soil is dry E depends on heat flux in soil and may be negatively correlated with E_s. An imperfectly evaporating surface may lead to a steady energy balance. Finally evaporation at different depths in the soil through the influence of soil temperature gradients is discussed. *Subject Heading:* **1. Evaporation from soil.**—*C.E.P.B.*

8.11–207 551.573

Uhlig, Siegfried, (*Bad Kissingen*), **Der tägliche Wasserverlust von Speicher und Schwimmbecken.** [Daily water loses from storage and swimming pools.] *Wasserwirtschaft*, Stuttgart, 46(7):180–181, April **1956.** 2 tables, 2 refs. **DLC**—Results of PENMAN's equation for the evaporation from free water surfaces give much too low values in the winter, compared with data obtained from the water balance of lakes. The actual daily water losses from swimming pools amount to 8% of their volume on the average which is 25–40 times the daily evaporation. *Subject Headings:* **1. Evaporation from swimming pools 2. Germany.**—*A.A.*

8.11–208 551.573:061.3

Tsuberbiller, E. A., **Soveshchanie po voprosu ob ispareni is poleĭ, zaniatykh sel'skokhoziaĭstvennymi kul'turami.** [Conference on the evaporation from fields under cultivation.] *Meteorologiia i Gidrologiia*, Leningrad, No. 6:67, Nov./Dec. **1955. DWB, DLC**—At this conference which was held by the department of geophysics of the Central Asiatic State University (Tashkent), came to the conclusion that Skvortsev's method is suitable for determining the total evaporation from both irrigated and non-irrigated fields, and rated highly the use of Skvortsov's evaporimetric coefficient for establishing sprinkling intervals and determine growing conditions for crops. *Subject Headings:* **1. Evaporation from plant cover 2. Irrigation calculations 3. Conferences 4. U.S.S.R.**—*I.L.D.*

8.11–209 551.573:646

Zil'ber, D. A. (*Leningrad Chem. Pharmaceut. Inst.*), **O dinamicheskom sposobe opredelenia skorosti ispareniia vlagi i gigroskopichnosti tkaneĭ odezhdy.** [A dynamic method of determining the rate of evaporation of moisture and the hygroscopicity of clothing fabrics.] *Gigiena i Sanitariia*, Moscow, 21(7):18–22, **1956.** 5 graphs. **DLC**—The continuous evaporation of moisture from clothing was measured by a technique which involves moistening the fabric with an electrolytic fluid and measuring the electrical resistance with a rheometer of wide range. The apparatus includes in its net an alternating current which on flowing through the object is transformed by means of selenium rectifiers into a constant current the magnitude of which is measured in the chain of the resistance by an electromagnetic device. The establishment of the resistance scale is described and the measurement of evaporation from fabrics moistened with NaCl solutions are discussed. Data in graphical form are given on the effect of radiation, wind velocity, on rate of evaporation from white cotton cloth and on the variation in the hygroscopicity of different types of cloth. *Subject Headings:* **1. Evaporation from clothing 2. Evaporation rate.**—*I.L.D.*

CONDENSATION

See also: **Air-borne radar to reduce aircraft icing hazards** (Battan), 8.11–74; **Condensation nuclei as carriers of radioactive particles** (Chamberlain et al.), 8.11–114.

8.11–210 551.574.1:537.5

Albani, Felix, (*Univ. Nac. de Cuyo et Servicio Meteorológico Nacional, Argentina*), **Sur l'action glaçogène de l'éntincelle électrique sur les nuages surfondus.** [On the ice forming action of electric sparks on supercooled clouds.] *Puy de Dôme. Observatoire, Bulletin, Ser.* 2, No. 1:7–10, Jan./March **1956.** 7 refs. French, Spanish and English summaries, p. 7. **DWB**

—Ice crystals can be produced in the laboratory in a supercooled cloud, by sparks between electrodes made of aluminum, silver, copper, nickel, lead, platinum or steel, but the greatest number are produced when silver electrodes are used. Nuclei are produced by the spark even at >0°C, and nucleation occurs at temperatures only slightly below 0°C. At least 10^5–10^7 nuclei/min. are produced at −5° to −7°C. Conditions in the atmosphere are not identical with those in the laboratory since during a lightning discharge there is no metallic electrode present. An attempt is made to differentiate between the nucleation caused by the sparks, by ozone or some other electrochemical product of the spark, or by products detached from the electrodes. *Subject Headings:* **1. Nucleation action of sparks 2. Silver electrode action on nucleation.**—*M.R.*

8.11–211 551.574.1

Aliverti, Giuseppina, **Sur les aérosols intéressants la météorologie.** [Aerosols of interest to meteorology.] *Geofisica Pura e Applicata*, Milan, 36:94–103, Jan./April **1957.** numerous refs. **DLC**—A critical survey of developments during the last decade in classification, in methods of measuring atmospheric nuclei, and particularly in the use of the Millipore filter for collection (J. Lodge, 1955), and the chemical analysis (B. K. Seely, 1952, and others) to determine the nature of the particles. Finally, the action of particles in nucleating supercooled clouds is reviewed. It is pointed out that the entire spectrum of particles from the tiniest to the coarsest, are of interest in one way or another to meteorologists. *Subject Headings:* **1. Nuclei measurement 2. Nuclei counters 3. Nuclei classifications.**—*M.R.*

8.11–212 551.574.1

Bayardelle, Maud, **Sur le mécanisme de la congélation de l'eau dans les nuages.** [Mechanism of water freezing in clouds.] *Académie des Sciences, Paris, Comptes Rendus*, 239(16): 988–989, Oct. 18, **1954.** 4 refs. **DWB**—Experiments were made with the spontaneous freezing of water dropleters. A consistent lowering of the freezing point was found with consecutive freezing tests. This is explained by the precipitation of nuclei. The discrepancies with recent theories are discussed. *Subject Headings:* **1. Cloud physics 2. Freezing nuclei.** —*A.A.*

8.11–213 551.574.1

Brin, André, **Étude expérimentale de la condensation de la vapeur d'eau à la surface de certains corps organiques.** [Experimental study of water vapor condensation of the surface of certain organic substances.] *France. Centre National de la Recherche Scientifique, Journal des Recherches*, No. 35:149–168, June **1956.** 36 figs., 4 tables, 16 refs. **DWB, DLC**—A study of water vapor condensation on the surface of certain organic substances, in which a simple apparatus (a condensation chamber) was used, revealed the importance for the formation of condensation nuclei, of molecules grouped in a way to attract water. Ultraviolet radiation favors the formation of condensation nuclei. In certain conditions the presence of a film of water was observed at the surface of oleic acid. On water-repellent substances like solid paraffin, water vapor does not condense unless supersaturated in relation to the temperature of the surface. *Subject Headings:* **1. Condensation nuclei 2. Condensation on various substances 3. Condensation processes.**—*Trans. of author's abstract.*

8.11–214 551.574.1:551.594.1

Chalmers, J. Alan (*Lecturer in Physics, Univ. Durham*), **The effects of condensation nuclei in atmospheric electricity.** *Geofisica Pura e Applicata*, Milan, 36:211–217, Jan./April **1957.** fig., 8 refs. **DLC**—In an attempt at explanation of the "sunrise effect" (an increase in potential gradient and in air-earth current with a decrease or no change in conductivity) the author examines convection or austausch, effects of additional and charged nuclei from industrial or domestic source or by a photoelectric effect and the effects of these on resistance, potential gradient, conductivity, current, etc. as causes and find added + charged nuclei as the best explanation as suggested by R. Mühleisen (*J. of Atmos. and Terrest. Physics*, 8:146–157, **1956,** *see* 7.8–261, Aug. 1956, *MAB*). *Subject Headings:* **1. "Sunrise effect" on atmospheric electricity 2. Nuclei effects on potential gradient 3. Charged nuclei.**—*M.R.*

8.11–215 551.574.1

Dufour, L. and Defay, R., **Sur la stabilité de l'équilibre des gouttelettes en suspension dans l'atmosphère.** [Stability of the equilibrium of droplets suspended in the atmosphere.] *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 29(2):102–106, **1956.** fig., 4 refs., 16 eqs. German, English and French summaries p. 102. **DWB**—On account of the limited volume of air surrounding each drop in a cloud, the stability of the drop must not be considered at constant temperature and partial vapor pressure but as the stability of a system where the total quantities of air and water are unchanged and where the temperature and the total external pressure only are supposed constant. The condition of this stability is related to the sign of the partial derivative of the affinity of condensation with respect to the advancement of this condensation. It is found that the drop will be stable if the volume of air available is smaller than a limiting volume, which may easily be calculated. For water droplets this volume is 1.3 cm^3 when the droplet's radius is 5.10^{-4} cm; it becomes 346 cm^3 for a radius of 2.10^{-3} cm. These limiting volumes are much greater than those existing in the clouds, where the air volume per drop varies between 10^{-3} and 2.10^{-3} cm^3. The droplets in the clouds are therefore thermodynamically stable. *Subject Headings:* **1. Stability of cloud droplets 2. Thermodynamics of clouds.**—*Authors' abstract.*

8.11–216 551.574.1:551.508.91:551.594.12

Holl, Walter, **Zum Einfluss der Kerne auf das Ionisationsgleichgewicht.** [The effect of nuclei on the ionization balance.] *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 29(2):83–89, **1956.** 4 figs., 11 refs., 4 eqs. German, English and French summaries p. 83. **DWB**—A recording nuclei counter has been newly developed for the purpose of investigating the influence of atmospheric condensation nuclei on the concentration n of the small ions, in the regions of nuclei numbers between 2000/cm^3 and 80,000/cm^3. If M stands for the nuclei concentration the relation can be expressed as follows: $n \cdot M^x = \text{const}$ where for x the values 1/2.3 was found in all cases. This fact can be explained with the aid of the theory of ionization equilibrium, if it is assumed that a firm coupling exists between nuclei concentration and the mean radius of the nuclei. *Subject Headings:* **1. Nuclei ion combination 2. Small ions 3. Nuclei counters.**—*Author's abstract.*

8.11–217 551.574.1

Isono, K. (*Geophysical Inst., Tokyo Univ.*), **On sea-salt nuclei in the atmosphere.** *Geofisica Pura e Applicata*, Milan, 36:156–164, Jan./April **1957.** 12 figs., 2 tables, 15 refs. **DLC**—The residues of cloud droplets collected at the summit of a mountain were examined with an electron microscope and their materials were identified with the aid of the micro-electron-diffraction method. About 30% of nuclei of cloud droplets larger than 5μ in radius were mainly composed of sodium chloride and their masses were $10^{-12} \sim 10^{-13}$ gr. We also found salt particles in snow crystals. Some comments are made about the process of the capture of these particles by snow crystals. Samples were collected at Nosori, Gumma Prefecture, Japan, (>1500 m elevation) in the summer of 1952. *Subject Headings:* **1. Sodium chloride nuclei 2. Electron microscope analysis 3. Snow crystal nuclei.**—*Author's abstract.*

8.11–218 551.574.1

Kassander, A. Richard; Sims, Lee L. and McDonald, James E., **Observations of freezing nuclei over the southwestern U. S.** *Arizona. Univ. Institute of Atmospheric Physics, Scientific Report*, No. 3, Nov. 1, **1956.** 18 p. 6 figs., 3 refs. **DWB?**—The results of daily flights in Jan. 1955 in the vicinity of Tucson, Arizona for the purpose of detecting natural freezing nuclei are presented. Samples were taken each day at 15,000 ft, 5000 ft and at the surface. No systematic correlation was noted with the long-term total rainfall record according to the Bowen meteoric dust hypothesis. However, the fact that average temperatures for given concentrations of nuclei were found to be within 2°C of temperatures for the same concentrations over Sydney, Australia is noted. Certain interesting observations on natural ice crystal clouds are also discussed. *Subject Headings:* **1. Freezing nuclei 2. Tucson, Arizona.**—*Authors' abstract.*

8.11–219 551.574.1

Litvinov, I. V., **Vliianie obzerneniia tverdykh chastits na spektr dozhdia.** [Effect of the nucleation of solid particles on the rain spectrum.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 2:232–235, Feb. **1956.** 4 figs., table, 7 refs. **DLC**—An attempt is made to verify the hypothesis that the spectra of rain formed by the melting of solid particles should be characterized by the absence of large drops, which may arise from meeting of coalesced particles, and by a large number of small droplets formed by the melting of simply granulated and not coalesced particles. This is accomplished by studying with the aid of the filter paper method simultaneously the rain spectrum at the surface and aloft above the level of the zero isotherm which determines the form of the solid particles upon which rain forms. The results obtained confirm the above hypothesis. *Subject Headings:* **1. Drop coagulation 2. Rainfall spectra.** —*I.L.D.*

8.11–220 551.574.1

*Mason, B. J. (*Dep. of Met., Imperial Coll., London*), **The nuclei of atmospheric condensation.** *Geofisica Pura e Applicata*, Milan, 36:4–20, Jan./April **1957.** 4 figs., 2 tables, numerous refs., 2 eqs. **DLC**—A rather detailed review of present state of knowledge of the amount, size, physics, origin, nature and behavior of Aitken nuclei, large and giant nuclei over land and sea, and of large and small ions, etc. The history of the study of nuclei in the last 75 years, quantitative values as shown on nomograms and tables taken from standard sources and a critical evaluation of results are included. (*See also* 8.4–260, April 1957, *MAB* for a review of the conference at Basel and Locarno on Oct. 1–4, **1956,** where this paper was presented as the opening lecture.) *Subject Headings:* **1. Condensation nuclei 2. Aitken nuclei.**—*M.R.*

8.11–221 551.574.1

Mason, B. J. (*Dep. of Met., Imperial Coll., London*), **The oceans as source of cloud-forming nuclei.** *Geofisica Pura e Applicata*, Milan, 36:148–155, Jan./April **1957.** 3 figs., numerous refs. **DLC**—The number and size of salt particles produced by the bursting of air bubbles in sea water has been measured. Bubbles of diameters varying between ½ and 2 mm each produced about 300 nuclei the sizes of which, under the electron microscope, were mainly between 0.1μ and 0.5μ diameter. They appeared to consist mainly of sodium chloride, the smallest ones containing only 10^{-15} g of salt. These results, together with measurements of the size distribution of salt nuclei collected over the oceans in areas of spray formation, indicate that the total concentrations of salt nuclei over the oceans in winds of up to 15 m sec^{-1} probably do not exceed 100 cm^{-3}. The corresponding rate of production of salt nuclei at the sea surface is estimated to be 1000 cm^{-2} sec^{-1}. It is therefore inferred that sea spray contributes perhaps only one-fifth of the nuclei involved in cloud formation, the majority being the products of combustion, either natural or man-made. *Subject Headings:* **1. Salt nuclei 2. Nuclei count 3. Nuclei size distribution 4. Nuclei over oceans 5. Sea spray nuclei.**—*Author's abstract.*

8.11–222 551.574.1:551.594.12

Nolan, P. J. and Kuffel, E. (*Univ. College, Dublin*), **Metal point discharge nuclei and the production of multiply charged ions from condensation nuclei.** *Geofisica Pura e Applicata*, Milan, 36:201–210, Jan./April **1957.** 3 figs., table, 9 refs., 5 eqs. **DLC**—Very small uncharged nuclei are produced by electric discharge at a metal point. By measuring the size and the super-saturation required for condensation it is shown that there is a vapour pressure deficit of 15%. The nuclei increase in size and in heterogeneity during storage. The range of radius is from 1.0×10^{-7} cm to 6.6×10^{-7} cm. When atmospheric nuclei are drawn past a discharging point they become multiply charged. The relation between the mobility, the diffusion coefficient and the charge per ion of these multiply charged ions does not agree with well-established theory. *Subject Headings:* **1. Uncharged nuclei 2. Charged nuclei 3. Nuclei-ion combination.**—*Authors' abstract.*

8.11–223 551.574.1:551.510.42

Oddie, B. C. V., **Atmospheric chemistry.** *Meteorological Magazine*, London, 86(1021): 194–198, July **1957.** 4 refs. **DWB**—Rain water from a number of stations is analyzed

monthly and air is drawn through dilute nitric acid and hydrogen peroxide. Although Na and Cl in air come from sea salt, ratio of Cl to Na is less than for sea water, and varies with distance from coast. Most of Na is deposited within 100 mi. JUNGE's theory of giant nuclei coming from the sea and large ions of continental origin is discussed. Additional stations are being set up in Britain for IGY. The importance of such studies is stressed. *Subject Headings:* **1. Saline nuclei 2. Atmospheric composition.**—*C.E.P.B.*

8.11–224 551.574.1:551.509.67

Sänger, Raymund, **Empfindlichkeit eisbildender Impfstoffe auf ihre Wasserlöslichkeit.** [Efficiency of ice forming seeding substances as affected by their water solubility.] *Zeitschrift für angewandte Mathematik und Physik*, 7(6):538–540, **1956.** 7 refs. **DLC**—The nucleating power of CuS and CrT, discovered by the author earlier, was doubted by MASON and MELLET, who assumed that samples were contaminated by AgI. Careful tests did not reveal any contamination. However, SÄNGER maintains that the different water solubility of the substances can explain the observed discrepancies. It should be important whether the seeding substance is already included in droplets or approaches undercooled droplets from the outside. *Subject Headings:* **1. Cloud physics 2. Cloud seeding 3. Cloud seeding substances. I. Mason, B. J.**—*A.A.*

8.11–225 551.574.42:551.513.1

§McQueen, Henry R. and Keith, Hubert C. (*Natl. Weather Analysis Center, U. S. W. B., Wash., D. C.*), **The ice storm of January 7–10, 1956 over the northeastern United States.** *Monthly Weather Review*, Wash., D. C., 84(1):35–45, Jan. **1956.** 7 figs., table, 16 refs. **DWB, DLC**—A synoptic case history study of the blocking situation which gave rise to widespread ice storms over New England, the Middle Atlantic States and Ohio Valley on Jan. 7–10, 1956. Unusually warm air was transported into the Newfoundland-New England area by the block, and unusually cold air into the Hatteras region where a low with a tropopause at 425 mb or 22,000 ft and temperature of −38°C was noted. The warm front moved westward from Nova Scotia to Lake Erie from Jan. 7 (1930E) to Jan. 10 (0730E) as shown on 12-hourly frontal position chart. The ice storm was somewhat ameliorated by the fact that the temperatures soon rose above freezing in most affected areas. *Subject Headings:* **1. Ice storms, New England (Jan. 1956) 2. Blocking action 3. Low tropopause 4. Synoptic case history studies 5. New England.**—*M.R.*

8.11–226 551.574.42

Orlicz, Michał and Orliczowa, Jadwiga, **Występowanie sadzi w Tatrach.** [Hoar frost deposits in the high Tatra Mountains.] *Przegląd Meteorologiczny i Hydrologiczny*, Warsaw, 7(3/4):107–140, **1954.** 11 figs., 26 tables, 21 refs. In Polish; French summary p. 139–140. **DLC, DWB**—Results of a very detailed study of hoar frost, a rather frequent phenomenon in the Tatra Mountains, carried out at the meteorological stations of Kasprovy Wierch in Poland (1988 m alt.) and Lomnica in Czechoslovakia (2635 m alt.) are presented in a number of tables, graphs and maps with explanations. Hoar frost formation often causes high tension lines to break interrupting the supply of electric current, and also results in damage to mountain forests. The paper deals with: 1) general information on the study of hoar frost in mountains; 2) number of days (actual and average) with hoar frost at each of the stations during 1941–53; 3) the quantity of hoar frost deposited, shown in kg/m²; 4) hoar frost formation in relation to meteorological factors (temperature, wind speed and direction, weather conditions, synoptic situations); 5) deductions relative to the organization of investigations of hoar frost in the mountains in Poland, in regard to the requirements of meteorology, climatology, electrotechnics and forestry. *Subject Headings:* **1. Hoar frost studies 2. Tatra Mountains, U.S.S.R.** —*A.M.P.*

8.11–227 551.574.7:551.508.82

Gvelesiani, P. I., **Zashchita amortizatorov samoletnykh meteorografov ot obledeneniia.** [Protection of airplane meteorograph shock absorbers against icing.] *Meteorologiia i Gidrologiia*, No. 6:39, June **1956.** photo. **DWB, DLC**—It is proposed that if the cloth cover of the shock absorber cord be kept dry then the cover would not freeze and shock ab-

sorption would be improved. The elasticity of the shock absorption cord was achieved by keeping the latter in a chlorinated tube so that it was kept dry. Repeated observations have shown that such protected shock absorbers provide for normal recording by the meteorograph. The dimensions of the tube, etc. are given and the meteorograph with the tube attachment is illustrated. *Subject Headings:* **1. Icing of meteorographs 2. Icing prevention.**—*I.L.D.*

FOG

See also: **Ice fog** (Robinson, Bell), 8.11–189.

8.11–228 551.575.1

Rodewald, M., **Erhöhte Nebelgefahr durch Kaltwasser im Westatlantik.** [Increased risk of fog through cold water in West Atlantic.] *Wetterlotse*, No. 120/121:180–182, July/Aug. **1957.** 2 figs., 2 tables. **DLC**—Very severe Labrador winter of 1956/57 caused great drift of ice and cold water in neighborhood of Newfoundland Bank. Sea temperatures in June fell to 2°C below normal at Weather Ships C and D. Seasonal warming was delayed a month. Whenever warm air flowed over this cold water, dense fog developed. *Subject Headings:* **1. Advection sea fog 2. Newfoundland Banks.**—*C.E.P.B.*

8.11–229 551.575.1:551.524.4

Urfer, Alfred (*Service Météorologique de l'Aéroport de Zürich*), **Sur les changements du gradient vertical de température dans le brouillard de rayonnement.** [Changes of the vertical temperature gradient in radiation fog.] *Geofisica Pura e Applicata*, Milan, 34:231–245, **1956.** 8 figs. (incl. photo), 7 refs., eqs. French, German and English summaries p. 231. **DLC**—During the dense radiation fog that occurred in Dec. 1951 over the Geneva-Cointrin airport and which lasted eleven days and attained a thickness of 1000 ft the author investigated the vertical temperature distribution by means of a meteorograph attached to a captive balloon. The results of the daily soundings are presented graphically and they present the change of temperature gradient between the atmosphere without fog and the atmosphere with dense and thick fog, the change of temperature gradient during the daily formation of fog, the temporary and local presence at variable heights of thin stratus with superadiabatic gradients in the very center of the fog, the presence of radiation inversion at the upper surface of the fog and the value of the temperature inversion within the fog. Three consecutive stages in the development of the fog were established, namely: the inversion state, the isothermal state and the approximately saturated adiabatic lapse rate. "Owing to radiation and evaporation, the top layer often shows unstability." There is presented evidence showing that the unstable layer gradually spreads downward while the temperature decreases in the whole fog. *Subject Headings:* **1. Radiation fog 2. Vertical temperature gradient 3. Geneva, Switzerland.** —*I.L.D.*

CLOUDS

See also: **Cloud physics** (Ludlain, Mason), 8.11–13; **Int. Cloud Atlas** (WMO), 8.11–14; **Int. Cloud Atlas** (WMO), 8.11–15; **Indirect aerology tropical Pacific** (Palmer et al.), 8.11–143; **Cloud effects on absorption** (Feigel'son), 8.11–176.

8.11–230 551.576.11

Maier, Wilhelm, **Ein- und mehrstufige Pilzwolken.** [One and many stage mushroom clouds.] *Meteorologische Rundschau*, 10(3):85–87, May/June **1957.** 4 figs., 2 refs. **DWB**—Experiments in artificial mushroom clouds are described. One is based on smoke rings of salammoniac formed by one or more blows on a membrane. The other consists of a leather pipette whose point leads into a large hollow sphere filled with liquid, into which injections can be squeezed. Fuchsin proved suitable for free-floating rings and many-stage mushrooms. Positive results depended on temperature, specific weight and cohesion; immiscible fluids gave no results. Comparison of experiment with thunderstorms shows that they do not precede them but are break-through phenomena of warm air masses under strato-cumulus. *Subject Heading:* **1. Artificial mushroom clouds.**—*C.E.P.B.*

PRECIPITATION

See also: **Rains: a statistical study** (Levert), 8.11–12; **Rainfall effects on forest nurseries** (Dunikowski), 8.11–96; **Cyclonic rotation in a radar echo** (Soane), 8.11–124; **Effects of off-shore vortex on precip.** (George), 8.11–172; **Temp.-thunderstorm rainfall relationships** (Buell), 8.11–190.

8.11–231 551.577:551.585.53

Grimes, A. E. (*U. S. W. B., Wash., D. C.*), **Unexpected moisture and vegetation on deserts.** *U. S. Weather Bureau, Weekly Weather and Crop Bulletin*, 42(28):7–8, July 11, **1955.** 14 refs. **DWB**—Discusses a few unusual phenomena pertaining to precipitation and its effect on vegetation in arid and semi-arid areas of the world: 1) Heavy but sporadic storms with heavy rains and cloudbursts exceeding often the normal yearly precipitation amount of the area; the projects for controlling water from these storms and storing it in reservoirs (sand dunes serve as natural reservoirs in the vicinity of Baltim, Egypt, where the annual precipitation is 7.87 in.). 2) Occurrences of frost and even snow during winter in the Gobi Desert, Atacama Desert, at Port Said, etc. 3) Importance of evaporation in determining the amount of rainfall and its effectiveness in a given area; 4) Role of fog, dew and mist. *Subject Headings:* **1. Abnormal desert rainfall 2. Water conservation 3. Abnormal desert snow.**—*A.M.P.*

8.11–232 551.577:551.557

Harper, W. G. and Beimers, J. G. D., **The movement of precipitation belts as observed by radar.** *Great Britain. Meteorological Research Committee, M.R.P.*, 1022, Dec. 17, **1956.** 7 p. 9 figs., 3 tables, 2 refs. Mimeo. **DWB**—Radar records of movement of 103 belts of precipitation at East Hill, Dunstable, in 1947–52, mostly associated with cold fronts or occlusions, were compared with radar winds at 50 mb intervals from 950–500 mb. Measurements were not possible on warm fronts. Correlation had a well defined maximum of 0.928 with winds at 700 m. This agrees with LIGDA's correlations for movement of small storm areas. Wind behind fronts was stronger than wind ahead but best correlation was with mean. Strong support is found for the forecasting rule: Cold fronts and cold occlusions move with a speed equal to the component of the wind across the front at the 700 mb level. *Subject Headings:* **1. Precipitation belts 2. Radar winds 3. East Hill, Eng.**—*C.E.P.B.*

8.11–233 551.577:541:132.3

*Herman, F. A. (*Dominion Experimental Station, Kentville, N. S., Canada*) and Gorham, E. (*Freshwater Biol. Assoc., Ambleside, Eng.*), **Total mineral material, acidity, sulphur and nitrogen in rain and snow at Kentville, Nova Scotia.** *Tellus*, Stockholm, 9(2):180–183, May **1957.** 2 tables, 8 refs. **DLC**—Analyses of total ash, sulfur, pH, ammonia and nitrate nitrogen have been made on 23 monthly precipitation samples and 17 individual snow samples collected between June 1952 and May 1954 at Kentville, N. S., in a predominantly agricultural area. Mean annual supply of total mineral ash was 95 kg/ha, of sulfur 9.1 kg/ha, of ammonia nitrogen 2.8 kg/ha, and of nitrate nitrogen 1.1 kg/ha. Average pH was 5.7, and rains more acid than this exhibited higher levels of both nitrate and sulfur, and a marked correlation between the latter and ammonia. Snow samples had much lower concentrations of ash, sulfur and nitrogen than rain samples collected in the same months, which may perhaps indicate a lower efficiency of snow flakes in removing materials from the atmosphere. *Subject Headings:* **1. Chemical composition of precipitation 2. pH content of precipitation 3. Chemical analysis of rainfall 4. Kentville, Nova Scotia.**—*Authors' abstract.*

8.11–234 551.577(495)

†*Mariolopoulos, Elias G. and Karapiperis, Leonidas N., **Hai brochoptŏseis en Helladi.** [Rainfall observations in Greece.] Athens, Ethnikon Typographeion, **1955.** 186 p. 20 tables, map (fold.), 58 refs. **DWB**—In over 80 pages of text and over 90 pages of tables, rainfall data from all Greek stations are analyzed, including 44 station records covering the period 1901–1944. A large format rainfall map of Greece (1901–1940) is added. The values tabulated include monthly precipitation amounts, deviations from normal, absolute yearly maxima and minima, frequencies of excess and deficiency, frequencies of specified amounts, largest 24-, 48- and 72-hour rainfall and number of days with rain, snow and hail. *Subject Headings:* **1. Rainfall data 2. Long period records 3. Excessive rainfall 4. Greece.**—*G.T.*

8.11–235 551.577(54)

*Ramakrishnan, K. P. and Narayanan, J., **A study of fifty years' rainfall of Visakhapatnam.** *India. Meteorological Dept., Memoirs*, 30(4):Aug. **1954.** 8 figs., 16 tables, 4 refs. **DLC**—Continuing his series of studies of the rainfall regime in various parts of India (Madras, Nagapattinam and Mangalore), the author presents data and detailed analysis of same, for Visakhapatnam 17°42′N, 83°18′E on the N.E. coast of India, for 50 yrs, 1901–50. Daily, 3-day, 3-day moving normals, rainfall associated with depressions in various locations, probability on a given day, greatest daily amounts, spells of rainy days and of days with heavy rains, annual variations, spells of dry weather, etc. are analyzed and data presented in tables and graphs. The most striking feature of the numerous graphs is the lack of any significant singularities (even onset of monsoon) and the extreme variability from day to day and from year to year on any given day. However, a possible maximum appears in the ½ month averages. *Subject Headings:* **1. Rainfall singularities 2. Rainfall data 3. Long period records 4. Visakhapatnam, India.**—*M.R.*

8.11–236 551.577.11

Browne, I. C. and Hudson, J. F. P., **The coalescence of water drops.** *Royal Meteorological Society, Quarterly Journal*, 83(357):386–387, July **1957.** fig., 2 refs. **DWB**—It has been considered that colliding droplets at first increase in joint surface energy. Authors show that this is incorrect. *Subject Heading:* **1. Coalescence.**—*C.E.P.B.*

8.11–237 551.577.2:551.501.81

Hiser, H. W. and Conover, L. F., **Investigation of rainfall measurement by radar, Aug. 1, 1955–Aug. 1, 1956.** Miami, Univ. of (Coral Gables, Florida). Marine Lab. and (its) Radar Research Laboratory, Contract Cwb-8614, Final Report, Sept. **1956.** 43 p. 10 figs.+4 photos, 8 tables, 3 refs. **DWB**—The project has established that a definite relationship exists between range, opacity of echoes on an integrated radar-scope photograph, and rainfall amounts. Families of curves have been drawn for a limited number of Ektalure "F" paper and Transmission Type "A" film photographs on which rainfall amounts from 0.20 in. to 2 in. have been correlated with the density (opacity) of the photographs. The present method of photographic integration of rainfall echoes as shown on a radarscope can be a useful tool for the hydrologist. Areal and to some extent point rainfall amounts occurring within 100 naut mi of the radar can now be determined from the photographic record to provide data not otherwise available to the flood forecaster. *Subject Headings:* **1. Radar rainfall measurement 2. Coral Gables, Florida.**—*Authors' abstract.*

8.11–238 551.577.2

Huff, F. A. and Neill, J. C., **Areal representativeness of point rainfall.** *American Geophysical Union, Transactions*, 38(3):341–345, June **1957.** 4 figs., 5 tables, 2 refs., 15 eqs. **DWB, DLC**—Shower-type rainfall data collected on several Illinois raingage networks, ranging in area from 19 ac to 400 sq mi, have been used to determine the areal representativeness of point rainfall measurements. Point rainfall was measured at the center of each area, and empirical relations for average and standard errors were developed for storm, weekly, and monthly periods. In addition, storm data for areas of 10 to 100 sq mi were used to obtain empirical relations between point and areal mean rainfall, when the point rainfall is measured at a gage displaced from the areal center by various distances. The results are considered representative of the Midwest and of other areas having similar climate and topography. *Subject Headings:* **1. Point-areal rainfall measurements 2. Point mean rainfall 3. Areal mean rainfall 4. Representativeness of observations 5. Illinois.**—*Authors' abstract.*

8.11–239 551.577.3

Horn, Lyle H.; Bryson, Reid A. and Lowry, William P., **An objective precipitation climatology of the United States.** Wisconsin. Univ. Dept. of Meteorology, Contract AF 19(604)-992, Scientific Report, No. 6, March **1957.** 33 p. 25 figs. (all maps), numerous tables in Appendixes, 12 refs., eqs.—This precipitation climatology of the U. S. utilizes two methods—harmonic analysis and relative intermonthly rainfall changes. The harmonic analysis gives a spatial and temporal description of the broad-scale precipitation features through use of

phase angle and amplitude maps. The intermonthly rainfall changes are presented by a series of maps which describe the relative precipitation changes between successive months. *Subject Headings:* **1. Precipitation regime 2. Harmonic analysis 3. Intermonthly rainfall changes 4. United States.**—*Authors' abstract.*

8.11–240 551.577.3:551.515.1(54)

Pisharoty, P. R. and Asnani, G. C. (*Met. Off., Poona*), **Rainfall around monsoon depressions over India.** *Indian Journal of Meteorology and Geophysics*, Delhi, 8(1):15–20, Jan. **1957.** 15 figs., 6 refs. **DWB, DLC**—Rainfall that occurred for 2 to 3 days within a radius of 350 mi from the centre of a depression along its track has been combined using the data of all raingage stations within that area. Such "composite" charts of rainfall were prepared for a sample of three mid-monsoon depressions in the year 1944. Falls of heavy rain of 3″ and above in 24 hrs are confined to an area lying to the left-hand side of the track. On any particular morning, the heavy rainfall area extends to about 300 mi ahead and to about 300 mi behind the center of the depression on that morning, measured, respectively, along the expected and past track of the depression. The width of the area is about 250 mi and extends to the left of the track. It is further noticed that out of this belt, about 30% of the area is almost the maximum over which there may be rainfall of 3″ or more in 24 hrs. The results are discussed from a forecaster's point of view. *Subject Headings:* **1. Monsoon rainfall 2. Monsoon depressions 3. India.**—*Authors' abstract.*

SNOW

See: also **Snowfall, winter 1954–55** (Ludlum), 8.11–127; **Snow gages for mountain stations** (Henning), 8.11–138; **Radiation from snow cover** (Kojima), 8.11–180.

8.11–241 551.578.41

Kataoka, Kenjirō (*Govt. Forest Exper. Station, Kambuchi Branch, Japan*), **On the measured values of water equivalent of deposited snow.** *Seppyo* (*Snow and Ice*), Tokyo, 18(3):91–93, Oct. **1956.** 2 figs., table, 2 refs. In Japanese; English summary p. 81. **DWB**—In this report are shown results of some experiments concerning the error of value of water equivalent of the deposited snow by snow sampler on the level land. From author's experiments, it seems that the measured values of water equivalent of the deposited snow vary considerably due to the difference of time, places and diameter size of the sampler used on the level land. Author points out from results obtained that much consideration should be paid to the survey of the water equivalent of the deposited water, especially in mountain areas. *Subject Headings:* **1. Water content of snow 2. Snow sampling.**—*Author's abstract.*

8.11–242 551.578.46

*Andrianova, K. I., **Kulisy—moshchnoe sredstvo povysheniia urozhaĭnosti.** [Snow slots: a powerful means of increasing productivity.] *Zemlevedenie*, Moscow, 4(6):32–36, June **1956.** 2 tables. **DLC**—The economics of two methods of snow conservation are compared on the basis of experiments since 1948–49 in several Ural or other semiarid grain producing areas and actual use in millions of hectares of grain fields in Kazakhstan during 1954–56. Snow retention ditches proved cheaper to construct and conserved 37% more snow (in one instance) than did mechanical snow retention methods and over 100% more snow than was the case when no conservation measures were attempted. *Subject Headings:* **1. Snow retention ditches 2. Snow conservation 3. Kazakhstan, U.S.S.R.**—*M.R.*

8.11–243 551.578.46:551.579

Brown, H. E. and Dunford, E. G., **Streamflow in relation to extent of snow cover in central Colorado.** *U. S. Forest Service. Rocky Mountain Forest and Range Experiment Station, Ft. Collins, Colo., Station Paper* No. 24, June **1956.** 9 p. 4 figs., table, 4 refs. **DWB**—During the spring of 1950 (a normal year) aerial photographs were made every week or so over the 33 square mile watershed (⅔ forested) of the St. Louis Creek in the upper Colorado River (at elevations from 9000 to 12,800 ft) to determine what relationship existed between area (%) of snow cover and cumulative discharge during the melting season. The relationship

is shown to be so good that forecasts of amount of discharge time of peak discharge and other parameters might be made early in the season on the basis of the ratios of peak discharge to total discharge when 16% of the area is bare or other similar ratios, providing the correlations hold good during other seasons. *Subject Headings:* **1. Snow cover-runoff relationships 2. Upper Colorado Basin, Colo.**—*M.R.*

8.11–244 551.578.46

Fukuda, Kiyoshi (*Sendai Met. Obs.*), **On the variations of the accumulated snow at Tohoku District.** *Seppyo* (*Snow and Ice*), Tokyo, 19(1):2–7, Jan. 1957. 4 figs., 2 tables, 11 refs. In Japanese; English summary p. 2. **DWB** —The variations of the accumulated snow from year to year were about periodic. The common periods were found to be 2, 5 and 17 yrs in all areas of Tohoku district; 7 yrs in the northern part and 10 yrs in the southern part. When + areas of monthly mean pressure deviations were very broad over Arctic Sea and Siberia and there were − areas over North Japan and Aleutians; accumulated snow was deeper, vis-à-vis. *Subject Headings:* **1. Snow accumulation variations 2. Tohoku District, Japan.**—*Author's abstract.*

8.11–245 551.578.46:77:656.7

Kazantsev, B. P , **Primenenie aerofotos"emki dlia izucheniia uslovii zaleganiia i skhoda snega.** [Application of aerial photography to the study of the occurrence and disappearance of snow cover.] *Meteorologiia i Gidrologiia*, No. 4:53–54, April 1956. **DWB, DLC**—The author describes the use of aerial photography in the study of snow cover conditions over the area between the Upper Oka drainage basin and the city of Orel. The aerial survey was made to determine the extent of snow cover during spring thaw and its approximate thickness. The technical aspects of this method including type of covers, establishment of a developing and printing laboratory at the aerodome, the role of weather, the working up of the data etc. are discussed. *Subject Headings:* **1. Aerial photography 2. Snow surveys 3. Upper Oka River Basin, U.S.S.R.**—*I.L.D.*

8.11–246 551.578.46:551.43

Vazhnov, A. I., **K raschetu vysoty sezonnoĭ snegovoĭ linii na gornom vodosbore.** [Calculation of the height of the seasonal snow line on a mountain watershed.] *Meteorologiia i Gidrologiia*, No. 4:46–49, April 1956. fig., table, 5 refs. **DWB, DLC** —The author presents a method for calculating the height of the seasonal snow line on the basis of data on maximum snow reserves, their changes with height of a locality in a mountain river basin and heat advection, the latter being characterized by the sum of positive air temperatures above 0°C. Equations for calculating the height of the seasonal snow line are derived and nomograms, applicable to Transcaucasia, for simplifying this calculation are constructed. The validity of the nomograms was tested; actual observations and the causes of the errors are analyzed. *Subject Heading:* **1. Snow line height determinations.**—*I.L.D.*

HYDROMETEOROLOGY

See also: **Spring flood forecasting, U.S.S.R.** (Komarov), 8.11–4; **Evap. and moisture in soil** (Philip), 8.11–206; **Snow cover-runoff relationships, Colo. Basin** (Brown, Dunford), 8.11–243.

8.11–247 551.579.5:551.501

Heigel, Karl (*Met. Obs., Hohenpeissenberg*), **Erfahrungen mit der "Carbid-Methode" zur raschen Bestimmung der Bodenfeuchte.** [Experiments with the "carbide-method" of quick determination of soil moisture.] *Wetter und Leben*, Vienna, 7(7):154–156, 1955. fig. **DWB, DLC**—The carbide method, used in the building *underlay* to determine rapidly the water content of moist materials, uses as a measuring principle the gas pressure of the acetylene evolved during the reaction of calcium carbide with water. The device developed for soil testing is described and results obtained by testing the soil moisture content with the calcium carbide method and weighing are presented. The carbide method shows a scatter of values owing to the fact that some of the water fails to react. The usefulness of this method for spot

analysis is suggested. *Subject Headings:* **1. Soil moisture determinations 2. Carbide method of soil moisture measurement.**—*I.L.D.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY

See also: **WMO. Climat. Comm.** (WMO), 8.11–23; **WMO. Climat. Comm., 2nd session** (Ashford), 8.11–25; **WMO. Climat. Comm., 2nd session** (Veryard), 8.11–26; **Horticultural climate** (Winter, Stanhill), 8.11–90.

8.11–248 551.58:681.177

Jacobs, Woodrow C., **Some problems associated with modern requirements for data processing.** *Meteorologische Rundschau*, 10(3):82–85, May/June **1957.** 3 refs. **DWB.** Also issued as *World Meteorological Organization. Commission for Climatology, 2nd, Wash., D. C., Jan. 1957, Papers*, CCl-II/Sp. 5, Jan. 23, **1957.** 11 p. 3 refs. **DWB** (M06 W927 cm CCl:1957)—After accumulation of 300 million climatological punched cards at Asheville in 12 yrs or more, results are examined. Horizons have extended but results of new methods and instruments are not always amenable to punched-card recording. Climatological punched cards are not suitable for electronic data processing. Hourly observations are frequently too detailed. Storage is difficult. Data processing involves three classes of requirements: summarization, searching for particular data, and scanning to discover new relationships. The centralization of data raises the problem of communication. *Subject Headings:* **1. Punched card applications to climatology 2. Data processing.**—*C.E.P.B.*

CLIMATE OF PARTICULAR PLACES

See also: **Climate, Moscow Basin** (Blumenstock, Prozorowski), 8.11–5; **Climat., Argonne Natl. Lab.** (Moses, Willet), 8.11–18.

8.11–249 551.582.1(438)

†Flis, Jan, **Szkic fizyczno-geograficzny niecki nidziańskiej.** [Physicogeographical sketch of the Nida Basin.] *Czasopismo Geograficzne*, Warsaw, 27(2):123–160, **1956.** 7 figs. (incl. photos), table, 108 refs. French summary p. 157–159. **DLC**—The description of the climate of the Nida Basin contains an isohyetal map showing mean annual rainfall and a table giving for several stations in different subregions, the mean Jan., July and annual atmospheric temperature and annual amplitude of temperature. *Subject Headings:* **1. Climate of Nida Basin 2. Isohyetal charts 3. Nida Basin, Poland.**—*I.L.D.*

8.11–250 551.582.1(83) 551.582:581.9

†Schmithüsen, Josef, **Die räumliche Ordnung der chilenischen vegetation.** [Spatial distribution of the vegetation of Chile.] *Bonner Geographische Abhandlungen*, Bonn, No. 17:1–86, **1956.** 10 figs., tables, 62 refs. Spanish summary p. 184–186. **DLC**—The detailed account of the vegetation zones and the constituent plant species and associations is followed by an analysis of the relationship between climate and plant distribution and zonation in Chile. With the aid of climatic data the author discusses the temperature, rainfall and cloud conditions in Northern Chile. The author examines the seasonal and total ecological characteristics of the climate and its manifestations, their vegetation regions of the country. Climatic data maps showing annual rainfall distribution and the distribution of unfavorable climatic portions in Chile and diagrams of cloud position are presented. *Subject Headings:* **1. Plant distribution 2. Vegetation zones 3. Climate of Northern Chile 4. Northern Chile.**—*I.L.D.*

8.11–251 551.582.2(595)

*Dobby, E. H. G. et al., **Padi landscapes of Malaya.** *Malayan Journal of Tropical Geography*, Singapore, Vol. 6, Oct. **1955.** 94 p. 13 figs., 57 plates, 28 tables. **DWB**—In Pts. 2, 3, and 4 of this comprehensive geographical study, the climate of each of 3 areas (Mukim Four, Wellesley Province; Mukim Dulang, Kedah; and Bagan Serai Triangle, Krian) is

discussed briefly and illustrated by means of histograms showing annual rainfall regime (p. 12–13, 40–41, and 63–64, resp.), by graphs and tables of temperature and precipitation, etc. *Subject Headings:* **1. Climate of Malaya 2. Malaya.**—*M.R.*

8.11–252 551.582.2(44.569.1)

*Sanson, J., **Evocation antique de météorologie religieuse.** [Religious meteorology in antiquity.] *La Météorologie*, Paris, No. 42:117–120, April/June **1956.** table. **DWB**—Monthly mean values of precipitation, temperature and humidity are tabulated for Damascus (and for Marseilles for the sake of comparison). From this table the general climatic characteristics of Palestine are derived (short spring, torrid summer, dryness of air from April to Oct.). Some special characteristics, like sandstorms, khamsin, violent thunderstorms and abundant dew are noted. Numerous passages are quoted from the Bible which refer to each of these characteristics. *Subject Headings:* **1. Climatic data 2. Climate of Marseilles 3. Climate of Damascus 4. Marseilles, France 5. Damascus, Syria.**—*G.T.*

CLIMATIC CHANGES

See also: **Climatic variations, Norway** (Hesslberg, Birkeland), 8.11–7.

8.11–253 551.583:519.24

Craddock, J. M., **A simple statistical test for use in the study of climatic change.** *Weather*, 12(8):252–258, Aug. **1957.** 3 figs., table, 3 refs., 6 eqs. **DWB**—A "filter" of meteorological time series is described which preserves only variations within certain time limits by taking two successive differences. Vienna July temperatures 1780–1940 are used as an example. *Subject Headings:* **1. Climatic changes 2. Statistical techniques.**—*C.E.P.B.*

8.11–254 551.583.3(238.1)

Wilhelmy, Herbert, **Eiszeit und Eiszeitklima in den feuchttropischen Anden.** [Ice age and ice age climate in the damp tropical Andes.] *Petermanns Geographische Mitteilungen, Ergänzungsheft* No. 262:281–310, **1957.** 5 figs., chart, 90 refs. **DLC**—This account deals with the Andes north of 0°. The Wurm snowline was almost parallel to present but 700–1000 m lower, 1400 m lower in arid middle section. There was no connected Pleistocene glaciation; only the higher summits and plateau over 3250 m were covered. Older (Riss) moraines extend lower. No trace of earlier glaciations can be found. Solifluction phenomena and glacial lakes are described. Pt. 3 deals with Pleistocene climate. A general fall of temperature by 4°C at sealevel, 5–6°C at higher elevations was the main cause of glaciation. Precipitation in the inner zone was not less and probably greater than present. Cloudiness was greater, evaporation and radiation less. Cold periods were times of increased meridional but decreased zonal circulation. The only region of much greater rainfall was Sierra Nevada de Santa Marta, on southern edge of Northern Hemisphere trade wind. *Subject Headings:* **1. Ice Ages 2. Tropical Andes.**—*C.E.P.B.*

MICROCLIMATOLOGY

See also: **Micromet. data compilation, Argonne Natl. Lab.** (Moses, Willett), 8.11–18; **Forest sites determined by slope insolation** (Wagner, Hunger), 8.11–98.

8.11–255 551.584:681.17

Halstead, M. H.; Richman, Robert L.; Covey, Winton and Merryman, Jerry D., **A preliminary report on the design of a computer for micrometeorology.** *Journal of Meteorology*, 14(4):308–325, Aug. **1957.** 33 figs., 8 tables, 46 refs., 29 eqs. **DWB**—Micrometeorological factors are: incoming solar radiation, state of atmosphere including horizontal pressure gradient, and condition of underlying surface. Analog computers have advantages over digital computers and units (panels) are described and applied to conditions over a large plain. Short wave radiation is given by latitude, day of year, hour, atmospheric moisture, cloud type and albedo, long-wave radiation by cloud height and percentage. Wind panel gives velocity $u(z)$ and Δu_0, assuming log distribution with height. Soil panel gives heat flux and temperature in

soil. These are combined in an energy balance panel. Simulated and observed curves of meteorological variables are compared. Limitations and possible improvements are set out. *Subject Headings:* **1. Micrometeorological research 2. Computing machines.**—*C.E.P.B.*

8.11–256 551.584

Ramdas, L. A., **Natural and artificial modification of microclimate.** *Weather*, 12(8):237–240, Aug. 1957. 4 tables. **DWB**—Microclimate of the open is the "shimmering layer." When the ground is vegetated we speak of "microclimate of the plant community." Microclimate may be modified by modifying conduction to ground below, convection, radiation or evaporation. Examples at Poona: application of a thin layer of chalk lowered mean daily maximum by 18°C, wetting by 11°C. Plot covered with a crop of "Aleev" and watered was further cooled. Evaporation was greater from black than white surfaces. These are microclimates of maximum activity compared with "static" underground cavities. Crops decrease range of temperature and increase moisture. *Subject Heading:* **1. Microclimatology.**—*C.E.P.B.*

CLIMATIC ZONES

See: **Desert climat.** (Monteith), 8.11–38; **Desert moisture and veg.** (Grimes), 8.11–231.

BIOCLIMATOLOGY

See: **Air conditioning** (Boch), 8.11–100; **Health resorts, Croatia** (Trauner), 8.11–110; **Meteorotropy of circulatory diseases** (Lippert), 8.11–111; **Heat and cold effects on man** (Bess, Henschel), 8.11–112; **Met. influences in disease** (Fieber), 8.11–113; special bibliography on **Medical meteorology**, p. 1518.

ENVIRONMENTAL INFLUENCES

See: **Air and soil temp. in a mountain wood** (Baumgartner, Hofmann), 8.11–91.

SYNOPTIC CLIMATOLOGY

See: **Synoptic climat., Moscow Basin** (Blumenstock, Prozorowski), 8.11–5; **Airport landing conditions** (Osmun), 8.11–76.

MISCELLANEOUS

COSMIC INFLUENCES

See: **Solar corona and geomag.** (Notuki et al.), 8.11–66; **Geomag. eclipse effects** (Volland), 8.11–67; **Solar flare effects on geomag.** (Watson), 8.11–68; **Solar flare effects on E layer** (Taubenheim), 8.11–161; **Sunspot effects on general circulation** (Glaser), 8.11–170

VISIBILITY

8.11–257 551.591.6

Stewart, K. H., **An approximate relation between slant visibility and horizontal visibility at ground level.** *Great Britain. Meteorological Research Committee, M.R.P.*, 1046, April 3, 1957. 5 p. 2 figs., 4 refs., 7 eqs. Mimeo. **DWB**—An expression is developed for variation of slant visibility with height in a water fog, using values for Cardington and London Airport. It was tested with a small lamp at Cardington and small balloons at London Airport. It gave a good representation on the average but large differences occurred on individual occasions. *Subject Heading:* **1. Slant visibility.**—*C.E.P.B.*

8.11–258 551.591.6:629.135

Stewart, K. H., **A method for assessing the frequency of dangerous visibility conditions.** *Great Britain. Meteorological Research Committee, M.R.P.*, 1047, April 3, 1957. 4 p. 3 figs.,

ref. Mimeo. **DWB**—Variation of slant visibility in and above a fog layer is shown schematically for two different fogs. The curves can be estimated from temperature and humidity soundings and horizontal visibility. A diagram gives for a critical height of 200 ft the line separating "safe" and dangerous conditions. At Cardington the latter occur for about 7 hrs a year. Uncertainty in this estimate arises from uncertainty in criteria for adequate visual guidance. *Subject Headings:* **1. Slant visibility 2. Aircraft landing.**—*C.E.P.B.*

OPTICAL PHENOMENA

See also: **Twilight emission of sodium, Antarctica** (Mayaud), 8.11–32.

8.11–259 551.593:535.36:517.5

Kogan, S. IA., **O metode sfericheskikh funktsiĭ v atmosfernoĭ optike.** [The method of spherical functions in atmospheric optics.] *Akademiia Nauk SSSR, Doklady*, 108(6):1053–1055, June 21, **1956.** 3 refs., 8 eqs. **DLC**—The method of solving the kinetic equation of Boltzman by means of spheric functions used in physics and atmospheric optics has a fundamental shortcoming, namely an arbitrary satisfaction of the limiting conditions. In this paper the author develops a method for obtaining a strict solution of the method of spherical functions: its application to the simple case of the isotropic diffusion of light in the atmosphere. *Subject Headings:* **1. Spherical function 2. Atmospheric optics 3. Light diffusion.**—*I.L.D.*

8.11–260 551.593.1

Abnormal refraction [in] Tyrrhenian Sea [and] Strait of Belle Isle [and] Canadian Waters. *Marine Observer*, 27(177):143–144, July **1957.** 4 figs. **DLC**—1) Aug. 21, 1956, in Tyrrhenian Sea, horizon and sea arched upward for 25°. 2) Aug. 10, 1956, 20 mi from C. Norman, lighthouse elongated and inverted image of upper part. 3) July 3, 1956, 44°N, 66°20′W, mirage of all lights on W. coast. *Subject Heading:* **1. Refractive phenomena.**—*C.E.P.B.*

8.11–261 551.593.55:535.33:546.33

Hunten, D. M., **Correction for Rayleigh-scattered light of sodium observations in twilight.** *Journal of Atmospheric and Terrestrial Physics*, 11(1):67–68, **1957.** 7 refs. **DWB**—It is pointed out that observations of sodium in twilight must always be corrected for Rayleigh-scattered white light and that the presence of the Fraunhofer lines must be allowed for. Otherwise they will effectively subtract from the sodium scattering and give a low value of the line brightness, particularly in early twilight. It is likely that this effect will mask the one recently treated by Donahue (1956), even after corrections have been made as well as possible. In any case, a small modification of the correction procedure will automatically take his effect into account to a good approximation. *Subject Heading:* **1. Sodium emission.**—*Author's abstract.*

8.11–262 551.593.63

Kinisky, J. J., **Noctilucent clouds.** *Weather*, 12(8):258–259, Aug. **1957.** table, 3 refs. **DWB**—At Edmonton, Alberta, June 27, 1956 0030–0240 MST, noctilucent cloud formed an orange to green-blue sheet resembling cirrostratus; edges fading into cirrus filaments. Illumination was comparable to brilliant aurora. At 0115 inverted virga; 0130–0155 very small lenticular areas were seen, but motion was too slow to measure. *Subject Headings:* **1. Noctilucent clouds 2. Edmonton, Alberta.**—*C.E.P.B.*

8.11–263 551.593.7:523.38

Focas, Jean-Henri, **Sur la variation de la proportion de lumière polarisée dans la pénombre, au cours de l'éclipse partielle de lune, du 15–16 juillet 1954.** [On the variation of the polarized light component in the penumbra during the partial eclipse of the moon, July 15–16, 1954.] *Académie des Sciences, Paris, Comptes Rendus*, 243(20):1490–1493, Nov. 12, **1956.** fig., 2 tables. **DLC**—Relative amount of polarized light on the lunar disk was measured in the penumbra during the eclipse of July 15–16, 1954. Polarization amounts are tabulated and presented graphically as functions of distance from the total shadow (where the value becomes

zero). As the solar light in the lunar penumbra during an eclipse is partly direct and partly refracted in the earth's atmosphere, it is suggested that it might be possible to relate variations of polarization in the penumbra during eclipses with the state of the corresponding part of the earth's atmosphere. *Subject Headings:* **1. Polarization in the penumbra during eclipse 2. Lunar eclipses.**—*G.T.*

ELECTRICAL PHENOMENA

See also: **Lightning and mag. field variations** (Norinder), 8.11–17; **Ionos. electron density distribution** (Kallmann), 8.11–160; **Condensation nuclei as carriers of radioactive particles** (Chamberlain et al.), 8.11–114; **Radioactivity in atmos.** (Israël), 8.11–115; **Nuclei effects on potential gradient** (Chalmers), 8.11–214; **Nuclei effects on ionization** (Hall), 8.11–216; **Metal point discharge nuclei** (Nolan, Kuffel), 8.11–222.

8.11–264 551.594.11:623.454.8

Pierce, E. T., **Nuclear explosions and a possible secular variation of the potential gradient in the atmosphere.** *Journal of Atmospheric and Terrestrial Physics*, 11(1):70–72, **1957.** table, ref., 6 eqs. **DWB**—Fair-weather potential gradient results from thunderstorms and certain ionizing radiations. Radioactive fall-out after nuclear explosions is producing a semi-permanent contamination of earth's surface. Mean annual values of potential gradient at 1 m on undisturbed days 1946–1956 compared with average 1928–1937 show a pronounced secular decrease at Eskdalemuir but not at Lerwick. *Subject Headings:* **1. Potential gradient variations 2. Atomic explosion effects.**—*C.E.P.B.*

8.11–265 551.594.12:621.396.11

Hines, C. O., **Heavy-ion effects in audio-frequency radio propagation.** *Journal of Atmospheric and Terrestrial Physics*, 11(1):36–42, **1957.** 2 figs., 5 refs., 16 eqs. **DWB**—The usual theory of whistler propagation, in which the effects of electrons alone are considered, leads to the conclusion that whistler ray directions cannot differ markedly from the direction of the geomagnetic field. When the effects of heavy ions are considered, however, it is found that all directions of propagation are possible at audio frequencies, and that the dispersion of frequencies takes place in opposite senses for longitudinal and transverse propagation. These theoretical results may suggest new possibilities for the detection of heavy ions and for the interpretation of some types of audio-frequency observations. *Subject Headings:* **1. Ion effects 2. Radio wave propagation.**—*Author's abstract.*

8.11–266 551.594.14:551.46:546.26

Arnold, James R. (*Dept. of Chem., Princeton Univ.*) and Anderson, Ernest C. (*Los Alamos Sci. Lab., Univ. of Calif.*), **The distribution of carbon-14 in nature.** *Tellus*, Stockholm, 9(1):28–32, Feb. **1957.** fig., 2 tables, 14 refs., 2 eqs. **DLC**—The carbon-14 activity of oceanic materials indicates that the mixing half-time for carbon between the atmosphere and ocean surface waters is one or two decades, while the turnover time for the ocean as a whole is several hundred years. This conclusion is consistent with estimates based on the measured decrease in carbon-14 specific activity on wood grown in recent years compared with 19th century wood. *Subject Headings:* **1. Radiocarbon in the atmosphere 2. Radiocarbon in the ocean.**—*Authors' abstract.*

8.11–267 551.594.21

Wormell, T. W., **Recent tendencies in research in atmospheric electricity [Summary].** *I.U.G.G. Association of Meteorology, Rome, Sept. 1954, Scientific Proceedings.* London, Butterworth, **1956.** p. 385–386. **DWB**—A general and brief discussion of some of the more important atmospheric electricity problems needing investigation, especially the source of electrification of thunderstorms, the dynamics of encounters between charged particles, the dependence of encounters upon charge, etc. *Subject Headings:* **1. Atmospheric electricity 2. Thunderstorm electricity.**—*I.L.D.*

8.11–268 551.594.22:621.316.98

*Stekol'nikov, Il'ia Samuilovich; Akopiai, A. and Beliakov, A., **Molniia i zachchita ot ee deĭstviia.** [Lightning and protection from its action.] *Akademiia Nauk SSSR*, [*Izvestiia*],

Otdelenie Teknicheskikh Nauk, Ser. 2, Energetika, No. 2, **1938.** 90 p. 50 figs., 16 tables, 30 refs., eqs. **DLC** (QC996.585)—A practical book giving information on the general nature of lightning and lightning strokes, primary and secondary (induced) strokes or charges, protection of buildings, etc. against both kinds of lightning (primary and induced), lightning rods, etc. with many illustrations (mostly schematic) and some data. *Subject Headings:* **1. Lightning 2. Lightning protection.**—*M.R.*

8.11–269 551.594.22:621.316.98

Stekol'nikov, Il'ia Samuilovich, **Izuchenie molnii i grozozashchita.** [Study of lightning and lightning rods.] Moscow Izd-vo Akademiia Nauk SSSR, **1955.** 158 p. 57 figs. (incl. photos and map). *Akademiia Nauk SSSR, Nauchnopopuliarnaia Seriia.* **DLC** (QC966.5843)—A small popular book discussing various aspects of lightning, atmospheric electricity, effects of lightning and protection against lightning. The history of modern scientific knowledge of lightning, beginning with FRANKLIN and LOMONOSOV in the middle of the 18th century, the nature and behavior of electric sparks or discharges, atmospheric and thunderstorm electricity, hail and hail protection, lightning discharges and their scientific study, ball lightning, auroras, effects due to voltage (on people and animals), to burning (animals, trees and buildings), induction, use of lightning as power source, practical aspects of lightning protection, etc. are reviewed in the 6 chapters (33 sections in all). *Subject Headings:* **1. Lightning 2. Lightning protection 3. Popular science books.**—*M.R.*

8.11–270 551.594.22

Wait, George R. (*Carnegie Inst. of Wash., D. C.*), **Aircraft measurements of electric charge carried to ground through thunderstorms.** (In: **Thunderstorm electricity.** Chic., Univ. of Chicago Press, **1953,** p. 231–237. 6 figs., ref.) **DWB**—Results of measurements made in 1947 and 1948 by a joint Carnegie and U.S.A.F. project, over the tops of 21 thunderstorms in a B-29 equipped with air-conductivity apparatus and Gunn-type electric field meters, making in all 65 traverses. Air conductivity measurements are discussed and data presented to show variations with altitude according to GISH & SHERMAN (1936) in the Explorer II, and according to data obtained on July 13, 1948 in a B-29, showing similar curves. Rapid changes in field over center of thunderstorm from 600–1800 volts/cm for an instant—probably due to lightning flashes. Graphs show potential gradient over thunderstorm Oct. 28, 1948, and electric field changes over thunderstorm on Aug. 17, 1948. *Subject Headings:* **1. Electrical conductivity over thunderstorms 2. Potential gradient over thunderstorms.**—*M.R.*

8.11–271 551.594.52

Gunn, Ross, **The non-equilibrium electrification of raindrops by the association of charged cloud droplets.** *Journal of Meteorology,* 14(4):326–331, Aug. **1957.** 2 tables, 10 refs., 9 eqs. **DWB**—When the number of collisions between raindrops and charged cloud-droplets is limited by life of drop or distance of fall, accumulated charge is often much less than equilibrium value, especially on larger raindrops. The first case considered is a raindrop falling through a cloud in which equal numbers of droplets carry + and − charges. As number of collisions increases, average charge on a raindrop grows and distribution finally becomes Gaussian. Other considerations however change this probability and this is considered quantitatively. The non-equilibrium distribution is calculated first for $C_+ = C_-$, and then for C_+ not equal to C_-. The relative magnitudes of random and systematic electrification when number of collisions is limited is discussed, and finally the probability of equilibrium electrification when sufficient charge is developed to modify the probability of collision by electrical interaction. *Subject Heading:* **1. Electrification of raindrops.**—*C.E.P.B.*

AURORAS

See also: **Aurora australis** (Vestine), **8.11–21.**

8.11–272 551.594.5

Aurora [in] North Atlantic Ocean [and] Hudson Bay [and] South Pacific Ocean [and] Australian waters [and] South Indian Ocean. *Marine Observer,* 27(177):145–150, July **1957.**

fig. **DLC**—A number of observations of aurora are reported, mainly from N. Atlantic in 50–60°N in Sept. 1956, in practice for IGY. A remarkable sketch comes from Australian waters in 34°20′S, 114°38′E. The aurora of Sept. 8 in the Indian Ocean reached an altitude of 40° in 29°S. *Subject Heading:* **1. Auroras.**—*C.E.P.B.*

8.11–273 551.594.51

Montalbetti, R. and Jones, A. Vallance, **Hα emissions during aurorae over west-central Canada.** *Journal of Atmospheric and Terrestrial Physics*, 11(1):43–50, **1957.** 3 figs., 5 tables, 12 refs. **DWB**—D. F. MARTYN's theory of the aurora is set out. It was tested by spectral observations at Churchill and Saskatoon. At Churchill 2 or 3 spectra were obtained each night, at Saskatoon 1 or 2. The diurnal variations do not support MARTYN's theory, showing a tendency for Hα to occur more strongly before midnight at Saskatoon and after midnight at Churchill. During strong aurora Hα emission tends to be observed simultaneously at both stations. At Churchill there is negative correlation between Hα intensity and magnetic activity, at Saskatoon positive. The zone of maximum proton moves south as magnetic disturbance becomes greater. *Subject Headings:* **1. Auroral theories 2. Martyn's theory of auroras.**—*C.E.P.B.*

8.11–274 551.594.51:535.33

Shepherd, G. G., **Absolute calibration of a low brightness source.** Saskatchewan. Univ. Physics Dept., Contract AF 19(122)-152, Scientific Report, No. AR-16, (**1955?**). 13 p. 2 figs., table, 5 eqs. **DWB**—A description is given of a low brightness source for use as a secondary standard for a scanning spectrometer. The procedure used for its absolute calibration against black body source is discussed. This will enable absolute values to be given to the intensity of auroral features and the sodium D lines in the twilight flash. *Subject Headings:* **1. Spectrometer calibration 2. Auroral intensity measurement.**—*Author's abstract.*

RADIO METEOROLOGY

See also: **Radio obs.** (Smith-Rose), 8.11–37; **Ionos. radio wave propagation** (Jewett, Evans), 8.11–159.

8.11–275 551.594.7:551.557:551.510.535

Banerji, R. B., **Methods of analysing fading records from spaced receivers, including preliminary analysis of such data at 75 Kc/s.** Pennsylvania. State Univ. Ionosphere Research Laboratory, Contract AF 19(604)-1304, Scientific Report No. 81, Jan. 15, **1956.** 53 p. 8 figs., table, 12 refs., 63 eqs. **DWB**—The statistics of the fading of radio waves from spaced receivers has been reconsidered to interrelate the existing methods of drift measurement and compare their effectiveness. An extension of the Pütter technique has been made to the case of random motions and indications are given concerning the extension to the case of anisotropy. Experimental results concerning the fading of 75 kc/s waves observed at State College during 1955 are briefly discussed. *Subject Headings:* **1. Radio fading patterns 2. Ionospheric drift.**—*Author's abstract.*

8.11–276 551.594.7:621.396

Sugar, G. R. (*Natl. Bureau of Standards, Wash., D. C.*), **Some fading characteristics of regular VHF ionospheric propagation.** *Institute of Radio Engineers, N. Y., Proceedings*, 43(10):1432–1436, Oct. **1955.** 11 figs., 3 refs., eqs. **DLC**—Some short-term fading characteristics of a type of ionospheric propagation first described by BAILEY et al. (*see* 4.5–236, May 1953, *MAB*) are presented and discussed. Continuous wave transmissions from Cedar Rapids, Iowa, on 49.8 mc were received at Sterling, Va., on either rhombic or Yagi antennas directed toward the transmitter. The second detector output of a linear receiver was used to provide a voltage proportional to the envelope of the received signal. This fluctuating voltage was recorded, edited, and then analyzed to determine the probability distribution and autocorrelation function of the signal envelope. The correlation of the envelopes of signals received on spaced antennas was similarly determined for antennas spaced both normal and parallel

to the transmission path. *Subject Headings:* **1. Ionospheric radio wave propagation 2. Radio fading 3. Radio wave transmission.**—*Author's abstract.*

8.11–277 551.594.7

Wait, James R. and Campbell, L. Lorne (*Radio Physics Lab., Defence Res. Board, Ottawa, Canada*), **The fields of an electric dipole in a semi-infinite conducting medium.** *Journal of Geophysical Research*, 58(1):21–28, March **1953.** 4 figs., 9 refs., 26 eqs. **DWB**—The behavior of an electric dipole situated above a semi-infinite conductor is investigated. Expressions for the electric and magnetic fields within the conductor are derived for the case that significant distances are much less than a free space wave-length. Curves are plotted which show the dependence on conductivity, frequency, and position of the observer. The application of the results to propagation in seawater is indicated. *Subject Headings:* **1. Microwave propagation 2. Electric dipoles.**—*Authors' abstract.*

8.11–278 551.594.7

Wait, James R. and Campbell, L. L. (*Defence Res. Board, Ottawa, Canada*), **The fields of an oscillating magnetic dipole immersed in a semi-infinite conducting medium.** *Journal of Geophysical Research*, 58(2):167–178, June **1953.** 3 figs., 9 refs., 66 eqs. **DLC**—The fields of an oscillating magnetic dipole immersed in a semi-infinite conducting medium are investigated. The axis of the dipole is taken to be parallel to the interface between the conducting medium and the semi-infinite insulating space above it. Various special cases are discussed in detail and are illustrated by graphs. *Subject Heading:* **1. Dipole fields.**—*Authors' abstract.*

8.11–279 523.75:551.594.7

Waldmeier, M., **Ein neuer Effekt chromosphärischer Eruptionen.** [A new effect of chromospheric eruptions.] *Naturwissenschaften*, 44(16):439, Aug. 15, **1957.** fig. **DWB**—An eruption was seen on E limb of sun, 1046-1230 world time, on April 16, 1957. There was total fading (Mogel-Dellinger effect) on 5320 m and increase on 2950 m. *Subject Headings:* **1. Solar eruptions 2. Anomalous radio propagation.**—*C.E.P.B.*

ACOUSTICAL PHENOMENA

8.11–280 551.596.1

Tsymbal, A. G. (*Zernovoĭ, Rostov area*), **Sluchaĭ vidimogo rasprostraneniia zvukovoĭ volny po vozdukhu.** [An instance of the visible propagation of soundwaves through the air.] *Priroda*, Moscow, 44(9):114–115, Sept. **1955.** fig. **DLC**—This case of visible sound waves is unique in that it was observed under a cloud free sky, was associated with reddish light and the center of the wave was visible not at the place where the explosion had occurred but at points at a considerable elevation in the free atmosphere. A diagram of the visible sound waves is presented. *Subject Heading:* **1. Visible acoustical propagation.**—*I.L.D.*

8.11–281 551.596.5

De Jong, J. J. G., **Donder over grote afstand hoorbaar!** [Thunder audible at a great distance!] *Hemel en Dampkring*, 54(5):102, May **1956.** Also: Berlage, H. P., **Enkele opmerkingen bij: donder over grote afstand hoorbaar.** [Further remarks on thunder audible at a great distance.] *Ibid.*, p. 102–103. **DWB, DLC**—In the first paper, thunder audible at a distance of 130 to 140 km from the center of a storm area at Den Helder was reported. The synoptic conditions over northwest Europe, coincident with the storm which seemed to converge from a mist along the coast, are described. It is suggested that an inversion in the lower layer of the atmosphere served as a horizontal sounding board. In the paper by Berlage the author gives further comments on the unusual thunder heard Nov. 6–7, 1955. The speed of sound propagation and the inversion as factors in the audibility of the thunder are considered but special attention is called to the possible role of prevailing wind conditions in this phenomenon. *Subject Headings:* **1. Audibility of thunder 2. Sound propagation 3. Den Helder, Netherlands. I. Berlage, H. P.**—*I.L.D.*

PART II. SELECTIVE ANNOTATED BIBLIOGRAPHY ON MEDICAL METEOROLOGY

By: *Isadore L. Dordick and Geza Thuronyi*

INTRODUCTION

This bibliography on medical meteorology is representative rather than exhaustive. It, therefore, consists of carefully selected papers which illustrate the present state of knowledge on the effects of weather upon human health and disease and the techniques employed in scientific investigations on the influence of weather on man. The literature that has been surveyed is largely contemporary, covering primarily the period after World War II; however, a few earlier papers are included in order to round out the scope of medical meteorology. In order to obtain a more comprehensive and systematic view of the entire field of medical meteorology the reader is referred to **Grundriss einer Meteorobiologie des Menschen** (3rd edition) by B. DE RUDDER.

The term medical meteorology is here restricted to include the role of weather and its elements, either individually or in various combinations, in the origin, incidence, and course of disease and other pathological phenomena in human beings. Accordingly, we have not included the extensive literature of physiological climatology which deals with the experimental study of physiological and psychological reactions to primary weather elements such as temperature, vapor pressure, air movement, radiation and atmospheric pressure under controlled conditions. Very good reviews of the field of physiological climatology, including both theoretical presuppositions, experimental procedures and results are found in the books **Temperature and human life** by L. P. HERRINGTON, **The physiology of heat regulation** by LOUIS NEWBURGH [*ed.*], and **Man in a cold environment** by A. C. BURTON and O. G. EDHOLM, and in the classic papers of the late W. C. BAZETT, the studies of the Harvard Fatigue Laboratory, the papers of WINSLOW, GAGGE and HERRINGTON (Pierce Laboratory of Industrial Hygiene, Yale University), the papers of SID ROBINSON, BELDING, etc. in the United States, of J. S. WEINER, FRANK ELLIS, MACKWORTH, etc. in Great Britain and of LADELL in Nigeria.

This bibliography was prepared under the sponsorship of the U. S. Public Health Service and in consultation with Dr. Wilton M. Fisher, Dr. Leon O. Emik and Nicholas E. Manos of the Air Pollution Medical Program, Division of Special Health Services.

DEFINITIONS OF SOME METEOROLOGICAL TERMS USED IN THIS BIBLIOGRAPHY

Anticyclogenesis "The sum of the processes which create and develop a new anticyclone or intensify an already existing one. The result of anticyclogenesis is, in the first case, the formation of an anticyclonic circulation, resulting in closed isobars surrounding a center of high pressure, or, in the second instance the crowding of the isobars around the pre-existing high, causing a strengthening of its circulation."

Cyclogenesis "The process which creates a new cyclone or which intensifies the circulation over a pre-existing one."

Downslide "Downslide of air masses is a downward motion of air masses which generally is not a simple perpendicular descent but rather proceeds more or less along surfaces of equal potential temperature. At the boundary of air masses of different temperature arises the downglide surface above which downglide takes place. The downglide surfaces play an important role in weather phenomena, in particular during the formation of fog and stratus clouds. These surfaces are found primarily at the anterior side of low pressure regions."

Equivalent temperature "The temperature to which air would come if subjected to a pseudo-adiabatic process until all its water vapor content had been condensed and then returned dry to its initial pressure."

Föhn "A dry wind with a strong downward component, warm for the season. Characteristic of many mountainous regions, notably the Alps and also the Rockies where it is known as the Chinook."

Front "The line of intersection of a frontal surface (i.e. the surface of separation between two different and adjacent air masses)."

"n-method" or method of interpenetrating samples. It is used only for testing the distribution of the numbers of events but never for testing directly measured quantities such as the number of leucocytes, values of blood pressure, body weight differences, etc. After establishing the time of occurrence of an event such as case of illness and the time of occurrence of the weather phenomenon (e.g. fronts, föhn, etc.) whose influence upon the illness is to be investigated, all days during which the weather phenomenon existed are designated as "N-days." Accordingly the first preceding day, the second preceding day are termed n−1 or n−2 days, respectively, and the first and second succeeding days are designated n+1 and n+2 days respectively. A detailed account of the use of the N-method is given in **Grundriss einer Meteorobiologie des Menschen** by B. DE RUDDER.

Potential temperature "The temperature to which air would come if it were reduced adiabatically to the standard pressure of 1000 millibars."

Upslide "An upward movement of warmer (lighter) air masses over cooler (heavier) along surfaces of equal potential temperature."

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8K–1 551.586:612.8

Aichinger, F. and Müller, I. L., **Das Vielfachelektrodermatogramm und seine Abhängigkeit von meteorotropen Wetterlagen.** [The multiple electrodermatogram and its dependence on meteorotropic weather situations.] *Annalen der Meteorologie, Medizin-Meteorologische Hefte*, Hamburg, No. 11:89–93, **1956.** 7 figs., 6 refs. **DWB**—The electrodermatometer of Regelsburger (E D M), useful for testing autonomic nervous reactions, is described. Measurements were made 4 times a day for 4–6 weeks on 30–50 subjects in winter and summer at Tübingen. The results present a very confused pattern, but departures from normal diurnal variation show considerable differences depending on the synoptic situation. (*Same item as* 7.11–92, Nov. 1956, *MAB.*) *Subject Headings:* **1. Weather effects on nervous reactions 2. Electrodermatograms.**—*C.E.P.B.*

8K–2 551.586:616

Armstrong, Charles, **Atmospheric conditions and the spread of poliomyelitis.** *American Journal of Public Health*, 41(10):1231–1237, **1951. DLC**—On the basis of the weekly incidence of poliomyelitis which occurred in 1950 in Wash., D. C. and adjoining Virginia and Maryland counties and the prevailing atmospheric and relative humidity reduced to 90°F, the author constructs frequency curves for each of the above variables and concludes that a causal relationship exists between poliomyelitis infection and atmospheric humidity. Dry air at 90°F tends to prevent infection with poliomyelitis in a population while a moist atmosphere at the same air temperature tends to favor its spread. Relative humidity of 27–28% air temperature of 90°F represents a critical level below which poliomyelitis spreads with difficulty. (*Same item as* 4.6–223, June 1953, *MAB.*) *Subject Headings:* **1. Humidity effects on poliomyelitis 2. Poliomyelitis 3. Washington, D. C.**—*I.L.D.*

8K–3 551.586:612.2

†Assmann, Dietmar, **Die Wetterfühligkeit des Menschen: Ursachen und Pathogenese der biologischen Wetterwirkung.** [Weather sensitivity of man: causes and pathogenesis of the biological action of weather.] *Jena, Gustav Fischer,* **1955.** 182 p. Bibliog. p. 160–171. **DLC** (QP82.A79). Review in *Angewandte Meteorologie,* 2(9):286–287, July **1956.** Review by S. Tyczka in *Przegląd Geofizyczny,* 2(3):189–191, **1957.**—In this monograph the author presents a none-too-critical review of a very large number of studies dealing with the normal physiological and pathological symptoms elicited in man by weather or by the individual weather elements. Also an attempt is made to explain the phenomena of weather sensitivity as a physical chemical effect of weather upon basic vital biochemical processes. The contents of this study are as follows: a brief historical survey of the development of bioclimatology; the normal rhythm (daily, seasonal) of vital processes and seasonal diseases; the pathological symptoms produced by the physical characteristics of weather such as atmospheric pressure, temperature, humidity, wind, precipitations, electrical conditions of the atmosphere including potential gradient, ions, etc.; the effects of the chemical characteristics of the atmosphere including the oxygen content of the atmosphere and its importance; variations in the oxygen content of respired air and their effect on man; the physical, chemical and biochemical processes involved in the exchange of air with the pulmonary alveoli and between alveolar air and the blood; the oxygen to the tissues and brain; trace gasses in the atmosphere including ozone; the effect of complex weather phenomena such as fronts, air masses, large scale weather situations and föhn upon human beings; the thermal balance of the human body, including cooling and sultriness; the effect of turbulence, upglide and downglide phenomena and inversions upon the manifestation of various clinical symptoms, etc. A special section is devoted to radiations including solar radiation, cosmic radiation, radiation of weather fronts; the biological effects of solar, cosmic, x-ray and high frequency radiation; the "weather radiation" of Bartels, etc. Various hypotheses of the pathogenic action of weather processes are summarized briefly. Methods of study of weather sensitivity, the universality of weather sensitivity as a biological phenomenon, etc., are considered. Finally, a physical chemical mechanism for the action of weather upon biological processes by way of an influence upon the enzymes involved in cellular respiration, oxidation-reduction potentials, vitamins and endocrine metabolism is suggested. *Subject Heading:* **1. Weather sensitivity.**—*I.L.D.*

8K–4 551.586:519.2

Bartels, Julius, **Zur statistischen Methodik.** [On statistical methods.] *Annalen der Meteorologie, Medizin-Meteorologische Hefte,* No. 8:39–43, 1953. 4 refs. Also: Berg, Hellmut, **Statistisch gewonnene Ergebnisse in der Medizin-Meteorologie.** [Statistical results in medical meteorology.] *Ibid.,* p. 43–51, 2 figs., 2 tables, 34 refs. Also: Hosemann, Hans, **Statistische Methoden und ihre Anwendung, gezeigt an Beispielen aus der Geburtshilfe.** [Statistical methods and their application, illustrated by obstetrics.] *Ibid.,* p. 52–67, 36 figs. **DWB**—Bartels gives a general comparison of the application of statistical methods in geophysics and biometeorology. Berg considers that bioclimatic material is often statistically inadequate and inexact. Meteorological factors are not single elements but weather complexes. Apparently valid relationships between the evidence of various diseases such as bronchial asthma, thrombosis, birth and death, appendicitis, etc. and fronts discussed. Hosemann describes various statistical methods suitable for medical climatologic studies, examples of the application of these methods and the variability of the results obtained. These methods are simple frequency distributions, correlation analysis, partial regression and time series. (*Same item as* 4.10–240, Oct. 1953, *MAB.*) *Subject Heading:* **1. Statistical methods in medical meteorology.**—*I.L.D. & C.E.P.B.*

8K–5 551.556:551.555.3:616

Bartsch, Georg Hans, **Tödliche Lungenembolie und Föhn.** [Fatal pulmonary embolism and föhn.] *Zeitschrift für Kreislaufforschung,* 25:695–699, **1933.** ref. **DNLM**—The author reviews some of the literature dealing with the relationship between föhn and the occurrence of thrombosis and embolisms. He then analyzes statistically 58 cases of death caused by pulmonary embolism which occurred during föhn or at least 12 hours before föhn weather began. The author concludes that at Innsbruck föhn does not influence pulmonary embolism. *Subject Headings:* **1. Föhn effects on pulmonary embolism 2. Pulmonary embolism.**—*I.L.D.*

8K–6 551.586:577.39

Baur, Franz, **Störungen des vegetativen Nervensystems und Wettergeschehen.** [Disturbances of the autonomic nervous system and weather processes.] *Archiv für physikalische Therapie,* 3:31–36, **1951.** 4 tables, refs. **DNLM**—The data of W. Amelieng and coworkers (*Archiv für physikalische Therapie,* 2:181–191, 1950), on the relationship between disease and weather processes, are analyzed statistically in order to determine when the various diseases associated with particular weather situations exhibit a nonrandom phenomenon. It is shown that the incidence of asthma depends upon weather conditions and the same nonrandom relationship is established for weather

and cardiovascular diseases. Various individual weather processes such as fronts, occlusions, up and down glide, stratus fog increases and their relationship to asthma, circulatory diseases, sleeplessness and headaches were examined statistically and it was found that sleeplessness alone manifests a random relationship to weather. The statistical data including the expectation values, upper limits of randomness of the relative frequencies, are presented in tables. *Subject Headings:* **1. Weather effects on nervous system 2. Nervous disorders.**—*I.L.D.*

8K–7 551.586:616

Becker, Friedrich, **Wettervorgänge und klinische Störungen.** [Weather processes and clinical disturbances.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte,* No. 42:414–418, **1952.** 4 figs., table, 4 refs. **DWB**—In biometeorological investigations a refined analysis is necessary of the various meteorological phenomena such as fronts. Accordingly, MÜGGE's method of analyzing cyclogenetic and anticyclogenetic processes into 5 principal processes is applied to studying the relationship between weather and clinical symptoms. The hourly incidence of such processes as upglide, warm front occlusion, etc. are correlated with the manifestations of various circulatory phenomena, embolism, asthma, etc. An analysis of clinical material extending over a period of one half year is presented. It is shown statistically that cardiac symptoms react to almost all weather disturbances especially cold fronts and unstable upglide processes; asthmatic patients react almost to the same degree to cold fronts, ground layer turbulence, upglide, etc. (*Same item as* 4.7–201, July 1953, *MAB.*) *Subject Heading:* **1. Weather effects on clinical symptoms.**—*I.L.D.*

8K–8 551.586:616.12

Berenson, G. S. and Burchi, G. E. (*Tulane Univ. School of Medicine, N. Orleans*), **The response of patients with congestive heart failure to a rapid elevation in atmospheric temperature and humidity.** *American Journal of the Medical Sciences,* Philadelphia, 223(1):45–53, Jan. **1952.** 3 figs., 2 tables, 17 refs. **DLC**—A clinical study of 25 subjects (13 control and 12 with conditions of chronic congestive heart failure) subjected for 40 to 14 min to atmospheric conditions in which the air temperature was 40°C and the relative humidity 85% (to 15%). The clinical reactions of the normal individuals and of those with heart diseases are itemized. The latter manifested reactions basically similar to, but less predictable than, the former. The hot and humid summer days brought about acute attacks of left ventricular failure characterized by severe dyspnea roles and gallop rhythm associated with apprehension and panic. (*Same item as* 4.2–255, Feb. 1953, *MAB.*) *Subject Headings:* **1. Weather effects on heart disease 2. Heart disease.**—*I.L.D.*

8K–9 551.586:616

Berg, Hellmut, **Die Auslösung von Krankheiten durch meteorologische und solare Vorgänge.** [Causation of diseases by meteorological and solar influences.] *Naturwissenschaftliche Rundschau,* 3(4):161–164, April **1950. DA**—The author reviews some of the literature regarding the causation of noninfectious diseases by meteorological and solar phenomena. The relationship of cold fronts, warm fronts and air masses to premature rupture of fetal membrane, pulmonary hemorrhage, etc.; the relationship of variations in the earth's electromagnetic field resulting from eruption of solar corpuscles and intense ultraviolet radiation to eclampsia; and the role of cold fronts in the production of asthma in guinea pigs are discussed. The mechanism of causation, which may be the action of ions, atmospheric electricity, ozone concentration and trace substances acting upon the autonomic nervous system, is considered. (*Same item as* 2.4–179, April 1951, *MAB.*) *Subject Heading:* **1. Weather effects on noninfectious diseases.**—*I.L.D.*

8K–10 551.555.3:551.586.11

Berg, Hellmut, **Die Wirkung des Föhns auf den menschlichen Organismus.** [The action of föhn on human beings.] *Geofisica Pura e Applicata,* 17(3–4):104–111, Oct.–Dec. **1950.** 14 refs. In German, German and English summaries p. 104. **DLC**—A summary of knowledge and theories to date concerning the effect of the Südföhn, which is prevalent in the northern Alps, on the human body or nervous system. The fact that the pronounced disorders which accompany the onset of the föhn occur before the warm air reaches the surface, leads to the hypothesis that the effect is produced by pressure oscillations or else by radiation or electrical (ionization) phenomena. (*Same item as* 2.5–112, May 1951, *MAB.*) *Subject Headings:* **1. Föhn sickness 2. Nervous disorders 3. Mountain meteorology.**—*M.R.*

8K–11 551.586:551.590.2

Berg, Hellmut, **Kosmische Einflüsse auf den Organismus.** [Cosmic influence on the organism.] *Annalen der Meteorologie, Medizinmeteorologische Hefte,* No. 5:1–17, **1951.** 16 figs., 23 refs. **DLC**—In this discursive article based upon a review of literature, the author discusses the role of the following cosmic phenomena in organic life, in particular man; diurnal rhythms as a problem associated with the earth's rotation, including the endogenous or exogenous origin of 24-hour

periods in biological processes; the effect of solar rotation in biological processes—evidence of a 27-day period on biological processes seems dubious; lunar periodicity in relation to the menstrual cycle, onset of labor pains, etc., for which evidence is dubious; the relationship of the 11-year sunspot cycle to the incidence of epidemics (no apparent relationship), etc., and the influence of nonperiodic cosmic phenomena such as terrestrial magnetic characteristic numbers upon evidence of eclampsia, embolism, etc. A mechanism for the possible influence of cosmic phenomena upon biological processes involving variable long wave solar radiation is considered. (*Same item as* 3.2–174, Feb. 1952, *MAB.*) *Subject Headings:* **1. Bioclimatology 2. Cosmic influences on biological processes.** —*I.L.D. & C.E.P.B.*

8K–12 551.586:616

Berg, Hellmut, **Statistische Untersuchungen zur Meteorotropie der fulminanten Lungenembolie.** [Statistical investigations of the meteorological relation of fulminant lung embolism.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B,* 3:308–323, **1951.** 5 figs., 7 tables, 17 refs. German, English and French summaries p. 308. **DLC**—The relationship between death resulting from fulminating pulmonary embolism and weather conditions was investigated in Cologne by using 252 cases, occurring over the period 1929–1940 in which clinical diagnosis was verified by histological examination. Statistical analysis of the diurnal frequency of incidence of cases of fulminating pulmonary embolism showed that their occurrence was not random but was grouped on particular days. The relationship could be established for this period between the incidence of pulmonary embolism and frontal passages (cold fronts, warm fronts, occlusions). A weak but statistically significant conclusion was established by the χ^2 method between incidence of pulmonary embolism and solar disturbances as described by the international magnetic character figure. Similar results were obtained for pathological material (226 embolisms) from Frankfurt a.M., Erlangen, etc. (*Same item as* 3.3–229, March 1952, *MAB.*) *Subject Headings:* **1. Frontal effects on pulmonary embolism 2. Solar effects on pulmonary embolism 3. *n*-method.**—*I.L.D.*

8K–13 551.515.8:616.24

Berg, Hellmut, **Zur Meteorotropie der fulminanten Lungenembolie.** [Meteorotropism of fulminant lung embolism.] *Annalen der Meteorologie, Medizin-meteorologische Hefte,* No. 9:60–73, **1953.** 5 tables, 37 refs. **DWB, DLC**—Previous work in Germany, which is fully summarized, showed an apparently real increase of frequency of lung embolism on days with passage of warm and cold fronts and thunderstorms. The evidence is discussed, leading to the conclusion that the connection though probable, is not yet statistically proved. (*Same item as* 6.1–141, Jan. 1955, *MAB.*) *Subject Headings:* **1. Frontal effects on pulmonary embolism 2. Pulmonary embolism.** —*C.E.P.B.*

8K–14 551.586:616.12

Bittner, Joseph E., **Prevention of heart disease and cancer (bioclimatology and etiology).** Yakima, Wash., Bittner Research Foundation, **1955.** 57 p. figs., photos, table, 15 refs. **DWB** (M82:612 B624p)—Review by Frederick Sargent II in *American Meteorological Society, Bulletin,* 38(6):381–382, June **1957.** In great detail the author examines the geographical distribution of annual mortality from cancer and heart disease and the mean annual cloud cover for the state of Washington by county. Comparative data for these parameters are also given for Arizona and the U. S. as a whole. On the basis of the coincidence of cancer and heart disease mortality with cloud cover, the author concludes that cancer and heart disease have a similar etiology namely a virus and that the precipitating factor in the development of these diseases is a reduced amount of ultra-violet radiation caused by extensive cloudiness. Detailed maps showing the distribution of mortality from cancer and heart disease by county in the state of Washington, the distribution of mortality from heart disease by states for the entire U. S., graphs showing the distribution of mean annual cloud cover by county in the state of Washington, graphs showing monthly death rate per 100,000 population from heart disease in Seattle, Wash. and number of cloudy days per month for each year in the period 1942–1947, similar data for cancer mortality, etc., are presented. *Subject Headings:* **1. Mortality due to weather 2. Cancer mortality 3. Heart disease mortality.**—*I.L.D.*

8K–15 551.521.11:551.586:616.5

†Blum, H. F. (*Princeton Univ.*), **Effects of sunlight on man.** *Meteorological Monographs,* Boston, 2(8):43–49, Oct. **1954.** 2 figs., table, 10 refs. **DWB**—A review of the literature dealing with the physiological and pathological effects of sunlight and of the different parts of the solar spectrum upon man. The discussion includes: the penetration of sunlight into the skin and eye, the photochemical effects of sunlight upon the skin as expressed in the sunburn complex, antirachitic action, production of skin cancer and in other skin diseases such as urticaria solare. Effects of solar radiant energy, the relationship between sunlight and health, and the role of sunlight, as a limiting factor on human survival, are considered. (*Same item as* 6.7–196, July 1955, *MAB.*) *Subject Headings:* **1. Sunlight effects on skin 2. Skin sensitivity 3. Skin disease 4. Urticaria solare.**—*I.L.D.*

8K–16 551.586

Boles, Russel I. and Westerman, Maxwell P., **Seasonal incidence and precipitating causes of hemorrhage from peptic ulcer.** *American Medical Association, Journal*, 156(15):1379–1383, **1954. DLC**—The relationship between manifest hemorrhage in peptic ulcer and meteorological conditions is investigated. An analysis of all cases of hemorrhage from gastric and duodenal ulcer admitted to the Philadelphia General Hospital over a period of 5 years (1949–1953) indicated a seasonal pattern. Hemorrhage from duodenal ulcer showed a significant increase during Jan., Feb. and March and during Oct., Nov. and Dec. For gastric ulcer the peak months were Jan., Feb., May and June. The monthly incidence of these complications was plotted against normal temperature change during each month for Philadelphia (1870–1950), average monthly temperature for the period 1949–1953 and average temperature change from month to month during 1949–1953. A visual correlation between incidence of hemorrhage and variations in temperature is obtained. The conclusion is added that changes in barometric pressure by influencing circulation are precipitating causes of hemorrhage. *Subject Headings:* **1. Weather effects on hemorrhage 2. Weather effects on ulcer.**—*I.L.D.*

8K–17 551.586:616.9

Brazol, Demetrio, **Enfermedades tropicales originadas por el clima en el continente Sudamericano.** [Tropical diseases caused by climate in the South American continent.] *Meteoros*, Buenos Aires, 5(4):323–344, Oct./Dec. **1955.** 3 figs., 2 tables, 16 refs. Spanish and English summaries p. 323. **DWB**—The author discusses the climatic parameters of the various infectious diseases (microbial, protozoan and virus, etc.). Also, nutritional and nervous diseases that are endemic in the tropical regions of South America. Maps showing the isopleths of equivalent temperature (after KNOCHE), and isochrones of the duration of intense heat in months per year, a diagram showing isopleths of equivalent temperature corresponding to the duration of cold in Buenos Aires and tables giving such bioclimatic data on equivalent temperatures and duration of warmest months, etc. for the various capitals of South America and a table giving climatic durations associated with various equivalent temperatures, etc. are presented. (*Same item as* 7.11–287, Nov. 1956, *MAB.*) *Subject Headings:* **1. Tropical bioclimatology 2. Tropical diseases.**—*I.L.D.*

8K–18 551.586:612

Brunnhölzl, K.; Schedel, F. and Ungenheuer, H., **Schmerzempfindung und Wetter.** [Pain sensitivity and weather.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 4(3):317–326, **1953.** 5 figs., 21 refs. German, English, French summaries p. 317. **DWB**—Using the "algimeter" (pain threshold meter acting through a manometer), the author carried out measurements twice daily on 16 patients at Munich; a total of 13,000 measurements were made. The results are plotted in relation to room temperature, relative humidity, frontal passages, atmospheric electricity and "relative number of biological weather effect" (RBW). The latter is calculated from 10 meteorological indicators, namely absolute value and change of temperature, relative humidity, vapor pressure, vertical temperature gradient; and also wind directions and velocity. The curves for the interdiurnal variation in pain sensitivity and in RBW show a parallel course in both sick and healthy subjects; a visual correlation is indicated. (*Same item as* 4.8–245, Aug. 1953, *MAB.*) *Subject Heading:* **1. Weather effects on pain sensitivity.**—*I.L.D.*

8K–19 551.586:612

Buck, Alfred, **Die Bedeutung des Elektrodermatograms in der Meteorobiologie.** [The importance of the electrodermatogram in biometeorology.] *Annalen der Meteorologie, Medizinmeteorologische Hefte*, No. 6:9–14, **1951.** 3 figs., 2 tables, 17 refs. **DWB**—REGELSBERGER's electrodermatogram measures the polarization voltage of the human skin which runs parallel to the diurnal variations of insensible perspiration. The daily variation of polarization voltage of the skin was measured over a period of 4 weeks on four patients suffering from pulmonary tuberculosis. Measurements were made at fixed intervals of 0700, 0900, 1100, 1300, 1600, 2000 and 2200 h. Curves of variation are shown and their statistical significance is calculated. A comparison of the diurnal variation of the skin resistance with the air mass calendar at Hanover shows that maritime tropical air (mT) markedly increases skin resistance. (*Same item as* 4.1–233, Jan. 1953, *MAB.*) *Subject Heading:* **1. Air mass effects on skin resistance.**—*C.E.P.B. & I.L.D.*

8K–20 551.586:612

†Buettner, Konrad J. K., **Physical aspects of human bioclimatology.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 1112–1125, 2 figs., 4 tables, 84 refs., 20 eqs.) **DWB**—An analysis of the application of physical principles to describe the heat balance of the human body is presented. Equations for calculating heat transfer by convection (in turbulent and laminar flow), by evaporation and by radiation; for calculating the total heat balance; for expressing the relationship between sultriness and heat and for calculating the equivalent

temperature of rooms; the mathematical expressions (température résultante, cooling power, standard operative temperature, cooling temperature) describing the cooling power of the atmosphere; and equations for calculating the effect of clothing upon thermal balance and for calculating heat loss through breathing are given. Special consideration is given to the equations of heat balance developed by the author himself. Present knowledge on the effect of solar radiation upon the human body, on the physiological effect of periodic and aperiodic weather processes, on the special effects of the environment above the lower stratosphere and that encountered in flights along trajectories equal to that of celestial bodies upon the human body and the effect of extreme heat and cold are discussed. (*Same item as* 3.9–4, Oct. 1952, *MAB.*) *Subject Heading:* **1. Physiological climatology.** —*I.L.D.*

8K–21 551.586:61:519.24

†Buettner, Konrad J. K. (*Univ. of Wash., Seattle*), **Present knowledge on correlations between weather changes, sferics and air electric space charges, and human health and behavior.** *Federation of American Societies for Experimental Biology, Federation Proceedings*, 16(2):631–637, July **1957.** 2 tables, 44 refs. **DLC** (QH301. F37)—The author reviews the various scientific approaches employed in studying the nature of the relationship between weather processes and various clinical phenomena manifested by human beings. These include the rhythmic method which includes the seasonal peaks of various diseases and diurnal course of diseases; the geographic method in which maps of climatic or other atmospheric elements are compared with maps of the incidence of disease; weather method involving the relationship between front, föhn, "free föhn," air masses, etc., with occurrence of various diseases, number of deaths, accidents, etc.; the relationship of weather type to illness; causative agent method which involves the relation of sferics and atmospheric ions to human behavior, diseases, etc., and the test tube method which involves the testing of the effect of sferics or ions on colloidal systems. Examples are cited from contemporary studies on medical meteorology but are not evaluated critically. *Subject Headings:* **1. Medical meteorology 2. Statistical methods in medical meteorology 3. Atmospheric electricity effects on biological processes.**—*I.L.D.*

8K–22 551.586:06(09)(43)

Burckhardt, Hans, **Drei Jahrzehnte Organisation bioklimatischer Arbeit in Deutschland.** [Three decades of the organization of bioclimatic work in Germany.] *Annalen der Meteorologie, Medizin-meteorologische Hefte*, No. 9:81–89, **1954.** 4 refs. **DWB**—An account of the history of bioclimatology in Germany from the 1920's to the present is given. Most of German bioclimatology is concerned with climatotherapy and resort medicine. Hence, most of this paper deals with the various climatotherapeutic methods established during this period in different parts of the country. With special regard to the interests of resort climates, the German weather service established during the 30's biometeorological research sections carrying on research into the evaluation of biotropic weather processes. The resurgence in biometeorological studies after World War II is described. Specific names of individuals and institutes and locations of institutes and government agencies involved in the development of bioclimatology in Germany are given. Literature citations are few. (*Same item as* 5.8–251, Aug. 1954, *MAB.*) *Subject Headings:* **1. Medical meteorology in Germany 2. History of medical meteorology.**—*I.L.D.*

8K–23 551.586:613.1

†Burton, Alan C. and Edholm, Otto G., **Man in a cold environment: physiological and pathological effects of exposure to low temperatures.** London, Edward Arnold, **1955.** 273 p. 75 figs., tables, numerous refs. *Monographs of the Physiological Society*, No. 2. **DLC**—This volume is a systematic treatise on the physical and physiological problems involved in maintaining a thermal steady state and assessment of the thermal demand in which tolerance can be maintained on a statement of hypothermia when heat balance is impossible. The individual chapters cover the following subjects: homeothermy, including its evolution, hibernation etc.; the physical laws of heat balance, including units of thermal insulation, heat debt, heat loss, etc.; thermal insulation of the air; thermal insulation of clothing and fur; thermal insulation of the body tissues; estimation of the thermal demand of the environment; vascular reactions to cold; metabolic response to cold; acclimatization to cold; hypothermia and resuscitation; and local cold injury. Each chapter is provided with an extensive bibliography. (*Same item as* 7.5–9, May 1956, *MAB.*) *Subject Headings:* **1. Low temperature exposure 2. Bioclimatology of cold regions 3. Medical climatology.**—*I.L.D.*

8K–24 551.586:616

Caroli, Günther, **Atmosphärische und solare Einflüsse auf die Fibrinolyse.** [Atmospheric and solar influences on fibrinolysis.] *Annalen der Meteorologie, Medizin-meteorologische Hefte*, No. 4:12–26, **1950.** 23 figs., 4 tables. **DWB, DLC**—In connection with routine tests on blood sedimentation rate carried out daily (except Sundays and holidays) over a period of one and a half years in Freiburg, measurements of fibrinolysis were also made. The frequencies of fibrinolysis

(total number of which is not given) were analyzed statistically in order to determine whether any correlation exists between fibrinolysis and various weather phenomena. A significant positive correlation +0.34 (highest random value, 0.24) was found between precipitation on the Feldberg and frequency of fibrinolysis; no correlation was found between fibrinolysis and such elements as 24-hour pressure change in Freiburg, relative humidity, wind velocity, etc. The *N*-method shows maximum evidence of fibrinolysis on days of passage of cold fronts. The correlation between fronts and fibrinolysis was 0.82 (random value = 0.32, $T = 6.38$). Static lability showed a correlation of 0.12 (maximum chance value 0.16) static lability without dynamically labile days correlation = +0.27 (maximum chance value 0.19). (*Same item as* 2.9–161, Sept. 1951, *MAB.*) *Subject Headings:* **1. Weather effects on fibrinolysis 2. Solar effects on fibrinolysis.**—*I.L.D.*

8K–25 551.586:615.8

Caroli, Günther and Pichotka, Josef, **Beeinflussung der normalen Blutgerinnungszeit durch das Wetter.** [Influence of the weather on the normal time of blood clotting.] *Naturwissenschaften*, 39 (9):193–195, May 1, **1952.** 3 figs., 3 tables, 6 refs. **DWB**—In the course of some 2150 determinat tions of blood clotting time carried out on 32 rabbits over a period of 80 days, it was found tha- on particular days marked deviations of clotting time from the normal were observed. Since these deviations proved to be statistically significant, their relationship to fronts, air masses, upglides, turbulence and various instabilities and to the terrestrial magnetic field was examined. Using the T-method of H. VON SCHELLING to study the relationship of days with marked positive and negative deviations of blood clotting time from the average to weather conditions, the author found that positive deviations are associated with turbulent vertical exchange processes in the atmosphere and negative deviations with large scale sliding processes in which warm air aloft slides over colder air at the surface. The same results were obtained where instability numbers were synchronized with days with positive and negative deviations. Positive deviations appear simultaneously or soon after the strong turbulent processes and negative deviations about 2 days following intense turbulence. Since turbulent processes in air masses are associated with cold fronts, the latter are then the principal factors in change of clotting time; negative deviations are associated with upgliding, especially with subtropical air masses. (*Same item as* 3.11–250, Nov. 1952, *MAB.*) *Subject Headings:* **1. Weather effects on blood clotting 2. Blood clotting.**—*I.L.D.*

8K–26 551.586:612.1

Caroli, G. and Pichotka, J., **Weitere Untersuchungen zur Beziehung zwischen Blutgerinnung und Wetter.** [Further investigation on the relation between blood clotting and weather.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 5 (3/4):403–412, **1954.** 2 figs., table, 11 refs. German, English and French summaries p. 403–404. **DLC**—In this series of experiments, the authors studied the clotting time of the blood of rabbits and the titration time of sodium thiosulfate in a 2% potassium iodide solution. A total of 3800 clotting times on 22 animals and 650 titrations of sodium thiosulfate were obtained. A correlation of +0.507 was found between titration and clotting time. The correlation between clotting and titration time and (1) air pressure was $+0.136 \pm 0.118$, (2) pressure change -0.01 ± 0.117, (3) cosmic rays -0.177 ± 0.183. Also statistical data are presented for the correlation between these environmental factors and clotting and titration time independently. (*Same item as* 5.8–255, Aug. 1954, *MAB.*) *Subject Headings:* **1. Atmospheric pressure effects on blood clotting 2. Cosmic ray effects on blood clotting 3. Blood clotting.**—*I.L.D.*

8K–27 551.586:612.27

Chekin, V. IA., **K voprosu o vliianii meteorologischeskikh faktorov na sosudistyĭ tonus.** [The influence of meteorological factors on vascular tone.] *Terapevticheskiĭ Arkhiv*, Moscow, 25 (1):71–73, Jan./Feb. **1953.** 6 refs. **DLC**—The nervous origin of hypertensive diseases is pointed out. The influence of atmospheric pressure upon vascular tone was investigated by measuring the arterial pressure of 512 males in a northern region during seasons when the barometric pressure varied 30–40 mm a day. Blood pressure was found to vary with changes in atmospheric pressure; and the variation was greatest in diastolic pressure. At an atmospheric pressure of 765–770 mm the systolic pressure was raised in 5.8% of the cases; at 742–745 mm systolic pressure increased among a larger number of individuals and at 702–746 the systolic pressure was higher among 10.5% of the subjects. The diastolic pressure showed an increase of 10.3% to 16.5% and 28% for the same atmospheric pressures. (*Same item as* 5.8–256, Aug. 1954, *MAB.*) *Subject Headings:* **1. Atmospheric pressure effects 2. Blood pressure.**—*I.L.D.*

8K–28 551.586:016

†Cordes, Hans and Zimmerman, Gerhard, **Bibliographie Klima und Mensch, 1950–1951.** [Bibliography of climate and man, 1950–1951.] *Germany. Deutscher Wetterdienst, Bibliographien*, No. 2, **1955. DWB**—This bibliography is a continuation of Cordes, **Bibliographie Klima und Mensch, 1945–1949** (*see* 4.2–256, Feb. 1953, *MAB*) which was published by the German Weather

Service in the U. S. Zone in 1950. It contains 782 items, most of them annotated dealing with all the various aspects in which climate and weather influence man. There are sections dealing with chemical climatology, bacteriological climatology, physiological climatology, skin blood metabolism, respiration, hormones, enzymes, etc., weather sensitivity, etc. An author index and list of periodicals cited are included. *Subject Heading:* **1. Bioclimatology bibliographies.**—*I.L.D.*

8K–29 551.586:616.921.5

†Cordes, H., **Die Grippe und ihre Beziehung zu atmosphärischen Einflüssen.** [Influenza and its relation to atmospheric conditions.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B,* 6(4):462–485, **1955.** 3 tables, 46 refs. German, English and French summaries p. 462–463. **DWB**—The literature on the relationship between weather and the occurrence of influenza epidemics is reviewed and it is found that anticyclonic weather and cyclonic perturbation are regarded as "influenza weather." Weekly statistics on new cases of influenza in Bavaria for the periods 1948–1949 to 1952/1953 were analyzed in relation to the weather maps constructed at Bad Kissingen for the same interval; data from the daily radiosonde (temperature and relative humidity in the free atmosphere) for Erlangen and Munich were collected. Three phases can be distinguished in the meteorotropism of an influenza epidemic: (a) the formation of the epidemic; (b) its course and (c) its large scale propagation. An atmospheric state characteristic of stationary anticyclones in winter is a condition for the genesis of an influenza. The genesis of epidemics requires stationary anticyclonic conditions (small rainfall on many successive days, light wind, saturated air and stable stratification). The spread of an epidemic is favored by a succeeding period of cyclonic weather, which lowers resistance. The world-wide spread of influenza epidemics is associated with the migration of high pressure areas. (*Same item as* 7.3–272, March 1956, *MAB.*) *Subject Headings:* **1. Weather effects on influenza 2. Influenza.**—*C.E.P.B. & I.L.D.*

8K–30 551.586:616.912.5

Cordes, H., **Über Zusammenhänge zwischen epidemischen Krankheiten und Wetter am Beispiel der Grippe.** [On connections between epidemics and weather as illustrated by influenza.] *Annalen der Meteorologie, Medizin-Meteorologische Hefte,* Hamburg, No. 11:131–132, **1956.** **DWB**—Weekly statistics of influenza in Bavaria in winters 1948/9–1952/3 show that epidemics occur in Jan.–Feb. after a succession of days of typical winter anticyclonic weather. When this is broken by cyclonic weather a sudden rise of the sickness curve occurs, but predominantly cyclonic weather does not give epidemics. Epidemic pneumonia and catarrh have the same relationships to weather. (*Same item as* 7.11–93, Nov. 1956, *MAB.*) *Subject Headings:* **1. Weather effects on influenza 2. Influenza 3. Bavaria.**—*C.E.P.B.*

8K–31 551.543:551.586

Courvoisier, P., **Luftdruckschwankungen und Wetterfühligkeit.** [Pressure variations and weather sensitivity.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B,*1(2): 115–126, **1949.** fig., 14 refs. Summary in German, French and English p. 115–116. **DWB**—Author's survey of pressure oscillations (Archiv, Ser. A, 1, 1948, p. 1) is analyzed, especially in the region of subacoustic frequencies. Oscillations of 0.5–120 sec showed no effects. Those of 2–16 Herz (0.5–0.06 sec), amplitude .01 mm Hg, gave reactions which were not quite comparable to föhn sickness. These are in the range of wind oscillations and the effects are probably not due directly to pressure, but knowledge is not yet sufficient. (*Same item as* 4–87, April 1950, *MAB.*) *Subject Headings:* **1. Atmospheric pressure variations 2. Föhn sickness.**—*C.E.P.B.*

8K–32 551.594.11:551.586:612

Courvoisier, Peter, **Die Schwankungen des elektrischen Feldes in der Atmosphäre und ihre Bedeutung für die Meteoropathologie.** [The variations of the electrical field in the atmosphere and their importance in meteoropathology.] *Experientia,* Basel, 7(7):241–254, July 15, **1951.** 5 figs., numerous foot refs., 7 eqs. English summary p. 254. **DWB**—Two fundamental problems of weather sensitivity are represented by the anticipatory sensations of approaching weather changes and that weather influences penetrate even into houses. In this paper, the author aims at presenting an intuitive basis for the hypothesis that electrical influences are the basis of weather sensitivity. This paper parallels in scope and methods previous studies by the author on the role of oscillation of atmospheric pressure in weather sensitivity, in particular by employing the method of constructing "spectra" of representative points of oscillation of the electric field. As in the case of pressure oscillations, such representative points of observed oscillations of the electric field group themselves into physically homogeneous regions. When curves of that correspond to PLANCK's law of radiation the question of the spectral slit widths of the instruments used for observations comes into consideration. This problem is solved by an analysis of the possible methods of measuring field oscillations and it is shown that sine widths that have a constant ratio to the observed frequencies can always be used. In as far as physical and geophysical aspects are concerned, there can be distinguished

frequency ranges in the spectrum that are subject either to the laws of electrostatics, electrodynamics or quantum physics. It is to be expected that influences on the state of health due to oscillations of the electrical field can be represented in the spectrum by systems of lines. The sensitivity curve of the eye may serve as an example. Little is known concerning other observations of such influences so that corresponding spectral lines cannot be assigned to them. An explanation of meteoropathological efforts could possibly be found in the spectrums of oscillations of the electric field of the atmosphere. This is an excellent theoretical paper. (*Same item as* 3.11–271, Nov. 1952, *MAB.*) *Subject Headings:* **1. Atmospheric electricity effects on weather sensitivity 2. Weather sensitivity.** —*Author's abstract & I.L.D.*

8K–33 551.586:616

†Daubert, K., **Troposphärische Einflüsse bei der Entstehung der Thrombose und Embolie.** [Troposphere influences in thrombosis and embolism.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte,* No. 42:418–425, **1952.** 4 figs., 3 tables, 37 refs. **DWB**—On the basis of extensive clinical material, the author investigated the relationship between embolism and thrombosis and various weather processes. The n-method, MUGGE's refined analysis of weather types and the method of dynamic daily weather processes were used. Thromboses were found to occur on the margin of high pressure areas, namely on the anterior side of low pressure disturbances and in particular in the transposition of a cold into a warm troposphere. Embolisms rarely occur within a high pressure area or during laminar flow of a wide warm sector. They are most frequent during cyclonic processes in particular during V-6 line upglide processes and turbulence and unstable processes in the center and on the posterior side of low pressure disturbances. (*Same item as* 4.7–202, July 1953, *MAB.*) *Subject Headings:* **1. Atmospheric pressure effects on thrombosis 2. Thrombosis.**—*I.L.D.*

8K–34 551.510.42:581.86:551.509.39

Dingle, A. Nelson (*Ann Arbor, Mich.*), **Meteorologic approach to the hay fever problem.** *Journal of Allergy,* St. Louis, 26(4):297–304, July **1955.** 23 refs. **DLC**—Atmospheric concentration of pollen does not depend on any one predictable factor such as temperature, but on the whole complex of "weather." Long range predictions are possible in terms such as are used for predicting phenological events (e.g., dates per harvest). Day-to-day forecasts are important during the immediate hay-fever season and should be available 36–48 hours before actual counts can be made and publicized. Variable conditions from place to place and hour to hour make specific local forecasts necessary. Fronts, windy weather and turbulence increase pollen concentration temporarily while rainfall decreases it. The meteorologist with some botanical knowledge can help in obtaining better pollen counts, can anticipate degree of severity of season and time of occurrence of severe conditions in any given locality. (*Same item as* 7.10–118, Oct. 1956, *MAB.*) *Subject Headings:* **1. Hay fever forecasts 2. Pollen pollution predictions 3. Allergy.**—*M.R.*

8K–35 551.586:612.2

Dingle, A. Nelson (*Met. Lab., Michigan Univ., Ann Arbor*), **Meteorological considerations in ragweed hay fever research.** *Federation of American Societies for Experimental Biology, Federation Proceedings,* 16(2):615–627, July **1957.** 12 figs., 30 refs., 27 eqs. **DLC** (QH301. F37)—The meteorological implications of the hay fever problem including the relationships of weather to pollen production and its transport are comprehensively discussed. The author considers the role of climate in the distribution of *Ambrosia* (ragweed); the relation of phenological stages to weather conditions; available theory of air transport of pollen including the molecular diffusion approach of Schmidt and its modification by Rombakis, the statistical approach developed by Sutton, and the relative merits of these two theories; the results of experimental studies on the aerial distribution of pollen, reflotations of pollen grains by turbulent winds; the penetration of ragweed pollen into enclosed spaces; measurement of pollen concentration, and the study of the allergic response of the patient in the clinical test chamber. *Subject Headings:* **1. Hay fever 2. Ragweed pollen 3. Weather effects on ragweed pollen.**—*I.L.D.*

8K–36 551.586:61:519.24

Dirnagl, K., **Statistische Betrachtungen zu einer meteorobiologischen Untersuchung.** [Statistical considerations in a meteoro-biological investigation.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte,* No. 42:371–374, **1952.** 3 figs., 4 tables, 7 refs. **DWB**—One of STOLBREITHER's questionnaires on the frequency of minor disturbances in well-being is so evaluated statistically that the role of various causal elements in the manifestation of variations of frequencies could be determined quantitatively. In the average person the weather influence amounts to $\frac{1}{16}$ of the nonsystematic scatter. In the average of 52 persons the factor of chance is reduced so much that 76% of the scatter can be considered as due to weather. The correlation coefficient between measures of the subjective feelings and the "relative biological weather effect" (RBW) of UNGEHEUER

is +0.61. The reliability is about half the highest possible theoretical value. Analysis of the correlation with the 10 individual elements of RBW results in an index with approximately the same characteristics as the relationship of RBW to temperature and vapor pressure. Only in the case of vapor pressure and air temperature does the correlation coefficient attain a statistically significant correlation coefficient. (*Same item as* 4.7–196, July 1953, *MAB.*) *Subject Headings:* **1. Weather sensitivity 2. Statistical studies in medical meteorology.**—*Author's abstract & I.L.D.*

8K–37 551.586:612:016(02)

†Düll, Bernhard (*Inst. für Met. und Geophysik, Univ. in Frankfurt a.M.*), **Wetter und Gesundheit, Teil 1. Die Reaktionszeitbestimmung als Testmethode zur Feststellung von Einflüssen des Wetters und der Sonnentätigkeit auf den gesunden Menschen.** [Weather and health, Pt. 1. Reaction time determination as a testing technique for determining the influence of weather and solar activity upon healthy individuals.] Dresden, Theodor Steinkopff, **1941.** 100 p. 46 figs., 3 tables, 88 refs. *Wissenschaftliche Forschungsberichte*, Vol. 54. **DLC**—The underlying thesis of the author is that weather acts upon the autonomic nervous system which mediates the effects of weather upon various physiological and psychological reactions of man in both health and disease. This study is based upon 10,000 responses to optic and acoustic stimuli during particular local and large scale weather processes and particular weather processes. The book includes the following: the "tonic weather effect," necessary requirements of suitable test methods for studying the effects of weather upon man; review of hitherto used test methods; the reaction time of man to sensory stimuli and its suitability for studying environmental influences, including apparatus evaluation of results, etc.; the effect of air temperature, atmospheric pressure, barometric instability, thunderstorm, sunshine duration, visibility, air masses, solar eruptions and terrestrial magnetic disturbances, the cosmic rays, ions, etc. upon reaction time. On the basis of the observations, the author concludes that reaction times are greatly influenced by cyclonic activity over Central Europe and by solar activity as expressed through various indices such as storms along the German coast, "bright chromospheric eruptions," sun spots foci, etc. This monograph has an extensive bibliography. (*Same item as* 6B–29, Feb. 1955, *MAB.*) *Subject Headings:* **1. Weather effects on nervous system 2. Medical meteorology bibliographies.**—*I.L.D.*

8K–38 551.521.64:612:616

†Duell, G. and Duell, B. (*Calif. Acad. of Science*), **Organic responses to cosmic rays and their secondaries.** *Meteorological Monographs*, Boston, 2(8):61–67, **1954.** fig., 40 refs. **MH-BH**—A brief discussion of the physical properties of cosmic rays is followed by an extensive review of the literature on the biological effects of cosmic rays. This includes a discussion and evaluation of the presumptive biological effects of cosmic radiation at high altitudes, the biological radiation dosage at altitudes above 20 km, the relationship between geomagnetic latitude, total intensity of cosmic radiation and cancer mortality and the results of experimental observation on the effects of ordinary cosmic rays and cosmic ray showers upon mutation rate in snapdragons, in the fruit fly, in rats, bacteria, etc. and on the induction of carcinogenesis in white mice (the work of FIGGE). Special attention is given to the studies of E. J. EUGSTER, of F. H. J. FIGGE and of E. P. GEORGE, M. GEORGE, J. BOOTH and E. S. HORNING. (*Same item as* 7D–98, April 1956, *MAB.*) *Subject Headings:* **1. Biological effects of cosmic radiation 2. Mutation rate 3. Carcinogenesis.**—*I.L.D.*

8K–39 551.586:616.002.77:616.72

Edström, G.; Lundin, G. and Wamner, T., **Investigation into the effect of hot, dry microclimates on peripheral circulation, etc. in rheumatic arthritic patients.** *Annals of the Rheumatic Diseases*, 7:76–83, **1948.** 5 tables, 7 figs., ref. **DNLM**—Over a period of six years the authors treated rheumatic arthritic patients in a hot dry climate (32°C and 33% RH) maintained artificially in a ward of the Rheumatological Department of the University of Lund. In 10 patients kept for about 100 days in this climate the following effects were observed: the peripheral circulation was increased in all, peripheral vasospasm was converted into peripheral vasodilatation. The relative oxygen saturation of venous blood measured at the medial cubital vein increased in the hot-room, while the arterio-venous difference diminished. The cardiac output per minute showed no statistically significant changes in cases of normal heart function, in cases with cardiac defect the heart function was improved. In most cases, no changes in caloric consumption and basal metabolism rate were observed. The effect on disease symptoms, remission of periarticular edema and capsular swelling on attached joints, diminished shifting pains, etc. are discussed. *Subject Headings:* **1. Climatic effects on rheumatism 2. Rheumatism.**—*I.L.D.*

8K–40 551.555.3:551.556.3

Ficker, Heinrich von and de Rudder, Bernhard, **Föhn und Föhnwirkungen. Der gegenwärtige Stand der Frage.** [Föhn and föhn effects: the present status of the problem.] 2nd enl. ed. Leipzig, Akademische Verlagsgesellschaft, **1948.** 114 p. graphs, charts, tables, 99 refs. *Probleme der*

Bioklimatologie, v. 1, **1948. DWB**—This very valuable monograph gives a complete account of the physical causes underlying the föhn wind phenomenon, of its effect on such natural phenomena as fires, floods, avalanche occurrence, drought, etc. in the Alpine regions and the medical effects of föhn. The contents are: 1) meteorology of föhn which includes föhn winds and katabatic winds, older föhn theories and the thermodynamic theory of katabatic winds; the geographic distribution of föhn winds; origin, formation and course of the South föhn in the Northern Alps and its accompanying phenomena, and the North föhn; 2) föhn effects in nature and 3) medical föhn problems which include symptomatology of föhn effects, pathogenesis of biological föhn effect. A critical review of the various theories accounting for the biological effect of föhn winds and therapy of föhn disease is presented. (*Same item as* 5.2–171, Feb. 1954, *MAB.*) *Subject Headings:* **1. Föhn winds 2. Katabatic winds 3. Föhn sickness 4. Alps.**—*I.L.D.*

8K–41 551.521.9:551.586:616

Figge, F. H. J., **Cosmic radiation and cancer.** *Science*, 105:323–325, March 29, **1947.** table, 3 refs. **DLC**—Attempt was made to intensify the rate of cosmic radiation by various combinations of lead plates and to compare the rate of carcinogenesis in mice exposed to intensified cosmic radiation with those exposed to normal cosmic radiation. One hundred and eighty-four C3H mice were injected with methylcholanthrene and divided into 8 groups. Tumors in controls, no lead shielding being used, developed more slowly than in mice covered with lead plate. The 50% latent period was 9.6 weeks for the controls and 6.7 for experimental animals. Induction of tumors was increased with amount of lead shielding, indicating increased ionizing radiation as cosmic rays pass through lead plates. A possible hypothesis for carcinogenesis is suggested and its implication to cancer prevention is discussed. (*Same item as* 4H–135, Aug. 1953, *MAB.*) *Subject Headings:* **1. Carcinogenesis 2. Biological effects of cosmic radiation.**—*I.L.D.*

8K–42 551.515.8:611.737.7

Fischer, Ernst, **Muscle strength and the weather.** *Archives of Physical Medicine*, 28(5):295–300, **1947.** 3 refs., 13 eqs. **DNLM**—Over a period of about a year, the author investigated intermittently the relationship between grip strength as measured by a Smedley band dynamometer and the passage of warm and cold fronts. No numerical data are given but graphs showing the variations of grip strength and simultaneous values of barometric pressure and air temperature for individual cases are presented. The author maintains that a distinct correlation exists between cyclonic disturbances and grip strength. On the basis of average values of grip strength for 12 subjects, the author concludes that warm fronts caused a decrease in grip strength while cold fronts increased grip strength. *Subject Heading:* **1. Frontal effects on muscle strength.**—*I.L.D.*

8K–43 551.586:616.2

Fladung, Horst Josef, **Plötzlicher Herztod und Wetter.** [Sudden heart failure and weather.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 4(1):85–96, **1952.** German, English and French summaries p. 85–86. **DWB**—The relationship between heart failure and various meteorological phenomena was investigated by examining 100 cases of death due to sudden heart failure which occurred in Frankfurt a.M. during the period 1948–1950. In every case, the clinically established diagnosis of heart failure was verified by autopsy. The hour of death was correlated with the approximate simultaneous occurrence of the following weather processes at the nearby Königstein (Taunus) bioclimatic research station of the West German weather service. These weather processes were upglide, labile upglide, warm front with upglide, cold front with turbulence, occlusion, trough aloft, föhn, lability, warm front with downglide, cold front with upglide, free föhn and calm weather. Whether the incidence of death from heart failure and these weather processes showed a relationship greater than chance was analyzed statistically by calculating the probability integral and by means of the chi-square (χ^2) method. A definite increase in the frequency of death could be established for the collective groups of weather disturbances, unstable ascending motions, warm front with ascending motion and cold front with turbulence; a decrease of frequency of heart failure was found to be associated with undisturbed weather. The relation between heart failure and cold front with ascending motion and föhn showed fairly high probabilities. No definite conclusions could be drawn regarding occlusions. (*Same item as* 3.11–253, Nov. 1952, *MAB.*) *Subject Headings:* **1. Weather effects on heart disease 2. Heart disease.**—*I.L.D.*

8K–44 551.571:551.54:551.586:612

Gaul, L. Edward and Underwood, G. B., **Relation of dew point and barometric pressure to chapping of normal skin.** *Journal of Investigative Dermatology*, Baltimore, 19(1):9–19, July **1952.** 4 figs. (1 fold.), 2 tables, 6 refs. Abstracted from reprint. **DWB**—The relationship between chapping of normal skin and weather was investigated on 8 subjects over a period of one year. Low dew points were clearly associated with high incidence of chapping; periods of low barometric pressure and sudden rise in pressure preceded each chapping incident; a preceding high dew point

and low barometric pressure suddenly changing to a low dew point and high barometric pressure constituted a meteorological pattern associated with chapping; and a high pressure required a lower dew point and a low dew point required a high pressure to be followed by chapping. High wind velocity, and rapid evaporation of water from the skin increased incidence of chapping. (*Same item as* 4.9–150, Sept. 1953, *MAB.*) *Subject Headings:* **1. Skin chapping 2. Humidity effects on skin chapping 3. Atmospheric pressure effects on skin chapping.**—*I.L.D.*

8K–45 551.521.64 551.586:616

George, E. P.; George, M.; Booth, Joan and Horning, E. S., **Influence of cosmic radiation on induced carcinogenesis in mice.** *Nature*, London, 164(4181):1044–1045, Dec. 17, **1949.** 2 tables, 3 refs. **DLC**—The effect of cosmic radiation on carcinogenesis in mice was investigated on the Jungfraujoch. Two hundred and fifty mice were inoculated with methylcholanthrene and equal groups were exposed in a tunnel under 60 m of rock (control group), in a cosmic ray chamber and in a similar chamber shielded with 2 cm thick lead screen. Total ionization measured was negligible and was greater in the tunnel than in the shielded cosmic ray chamber. The results were inconclusive. Experiments were repeated under a different set of conditions at sea level with some 400 mice. Local shower production was eliminated by using a building without iron girders. The mice received the same amount of carcinogen as that used on the Jungfraujoch and were placed under lead shields of different thickness. Mice under shield thickness of 1 and 2 cm of lead (under which showers are most pronounced) developed tumors more quickly than mice under greater thickness of lead. (*Same item as* 7C–28, March 1956, *MAB.*) *Subject Headings:* **1. Biological effects of cosmic radiation 2. Cosmic ray effects on carcinogenesis 3. Carcinogenesis 4. Jungfrau, Switzerland.** —*I.L.D.*

8K–46 551.586:616.24:519.2

Geppert, Maria-Pia, **Zur statistischen Methodik der bioklimatischen Forschung.** [On statistical techniques in bioclimatic research.] *Annalen der Meteorologie, Medizin-Meteorologische Hefte*, No. 9:21–25, **1954.** 4 tables, 11 refs., 9 eqs. **MH-BH**—W. Sandritter and F. Becker analyzed a period of 26,200 hours during which incidents of pulmonary embolism were observed in relation to eight types of weather. The observations are converted into tetrachoric (2×2) tables, and the probabilities of real associations between embolism and weather are tested by the chi-square and other statistical methods. Significant relations ($P < 0.1\%$) are shown to exist between incidence of pulmonary embolism and (1) stable upglide, (2) labile upglide, (3) warm front, (4) cold front, (5) free föhn (below 1000 m), and a significance of $P = 1\%$ for (6) turbulence aloft. (*Same item as* 5.8–259, Aug. 1954, *MAB.*) *Subject Headings:* **1. Weather effects on pulmonary embolism 2. Statistical methods in medical meteorology 3. Pulmonary embolism.**—*C.E.P.B. & I.L.D.*

8K–47 551.515.8:616.24

Gitis, I. I., **Vliianie klimata i pogody na chastotu i godovoĭ khod pnevmonii.** [Influence of climate and weather on the incidence and annual variation of pneumonia.] *Gigiena i Sanitariia*, Moscow, 22(2):58–60, Feb. **1957.** fig., table, refs. **DLC**—The relationship between the incidence of pneumonia and frontal passages is analysed in reference to the air mass types involved in the frontal passages. Monthly frequencies of pneumonia in percent of annual total are presented for various cities in the U.S.S.R. and a graph showing the mean areal variation of pneumonia for two different decadal periods is reproduced. It is maintained that the degree of continentality of the climate of a given locality and the relative frequency of this type or other types of weather influence the incidence of pneumonia. *Subject Headings:* **1. Frontal effects on pneumonia 2. Pneumonia.** —*I.L.D.*

8K–48 551.586:612.2

Goodwin, J. E.; McLean, J. A.; Hemphill, F. M. and Sheldon, J. M. (*Michigan Univ., Ann Arbor*), **Air pollution by ragweed: medical aspects.** *Federation of American Societies for Experimental Biology, Federation Proceedings*, 16(2):628–631, July **1957.** 2 figs., table, 10 refs. **DLC**—The results of an experimental study of 11 patients suffering either from hay fever alone or from hay fever combined with asthma are reported. It was found that the "patients' subjective symptoms seemed to follow the general seasonal pollen pattern better than did their objective findings, although there were many exceptions." In asthmatic patients the vital capacity level was abnormal more times than any of the other pulmonary ventilatory tests. In the hay-fever patient the vital capacity levels and maximum aspiratory flow rates were abnormal occasionally. The quantitative blood counts and pulmonary function tests were not abnormal, with a greater frequency during the peak of the pollen season. "The rise in pollen counts in the morning followed rather than preceded the daily increase in the subjective symptoms for both hay fever and asthma." *Subject Headings:* **1. Hay fever 2. Ragweed pollen.**—*I.L.D.*

8K–49 551.515.8:616.925

Gowen, G. Howard, **Onset and cause of epidemic meningitis as related to fluctuations in temperature and barometric pressure.** *The Journal of Laboratory and Clinical Medicine*, 23(4):385–389, **1938.** 2 figs., 5 refs. **DNLM**—The cases of epidemic meningitis that occurred in Sangamon County, Ill. during 1935 are analyzed. The onset of this disease, of which about 30 cases were reported, was studied in relation to concomitant weather which included mean daily barometric pressure, mean daily temperature, cloudiness, etc. The author concludes that frontal passages are significant factors in the invasion of the organism by the meningococcus. *Subject Headings:* **1. Frontal effects on meningitis 2. Meningitis.**—*I.L.D.*

8K–50 551.586:616

Halse, Thor and Querret, Gertrud, **Klimatische Einflüsse in der Thrombogenese.** [Climatic influences in thrombogenesis.] *Deutsche Medizinische Wochenschrift*, 73(9/12):125–127, **1948.** fig. **DNLM**—Some of the literature on the relationship between weather and thrombosis and embolism is summarized and the difficulties of statistical studies are stressed. On the assumption that thrombosis is an intravasal clotting, an attempt is made to study the influence of weather processes upon prothrombin. In 57 bed-patients of varying age groups, sex and diagnoses, the prothrombin index was determined according to a modification of the QUICK-LEHMANN method and clotting time was determined during May–July 1946. No definite correlation could be established between prothrombin index and atmospheric pressure, temperature, vapor pressure, wind velocity and cloudiness. However, in the case of peculiarities in atmospheric pressure variations associated with occlusions and frontal passages there was observed a hyper-prothrombin index. *Subject Headings:* **1. Atmospheric pressure effects on the thrombosis 2. Thrombosis.**—*I.L.D.*

8K–51 551.586:616

Hauck, Ernst, **489 Kranke mit Konkrementbildung in den ableitenden Harnwegen, ein Beitrag zur Ätiologie und Meteorobiologie.** [489 cases with calculi in the urinary passages.] *Zeitschrift für Urologie*, 37(1):3–16, **1943.** 8 illus., ref. **DNLM**—The relationship between renal calculi and frontal passages was investigated. It was found that 83.8% of all calculi occurrences were on days with frontal passages on the first pre- and post-frontal days, 13.56% of all calculi on the second pre- or post-frontal days or on days at the end of high pressure period and for only 2.64% of all calculi could no weather influence be shown. *Subject Heading:* **1. Frontal effects on kidney disease.**—*I.L.D.*

8K–52 551.575:541.132.3:616.5

Heinke, E. and Heinke, Herrmann, **Die Abhängigkeit der Aciditätsverhältnisse der Hautoberfläche von denen der Nebelkerne.** [Dependence of acidity condition of the skin surface upon the acidity of cloud droplets.] *Archiv für Dermatologie und Syphilis*, 190:260–283, **1950.** 5 figs., 3 tables, refs. **DNLM**—An extensive series of experiments was carried out on individuals to determine whether any relationship exists between the pH of the skin and that of atmospheric condensation products. Measurements were made over extensive periods during the different seasons, the subjects were male and female and the ages ranged from 16 years upwards. Only a slight positive correlation between the pH of the skin and that of the atmospheric condensation products (average $r^2 = 0.34 \pm 0.42$). Correlations have different magnitudes in various disease groups. However, no correlation could be established in healthy working individuals. *Subject Headings:* **1. pH content of fog 2. Fog acidity effects upon skin.**—*I.L.D.*

8K–53 551.586:612.2

Hentschel, G., **Meteorotropismus im Tagesrhythmus des menschlichen Befindens.** [Meteorotropism in the daily rhythm of human health.] *Angewandte Meteorologie*, 1(9):283–288, Feb. **1953.** fig., 3 tables, 9 refs. **DWB**—Observations of physical and mental state and of aches and pains in tuberculosis hospitals were compared with cloud conditions. A clear relation was found with state of sky, especially near fronts, the normal morning cloud minimum and afternoon maximum being associated with an afternoon maximum of sensitiveness. With unchanging cloud conditions the normal daily variation of sensitiveness was largely suppressed but cloudless sky or stratus without higher cloud brought considerable improvement at all times of day. (*Same item as* 4.9–236, Sept. 1953, *MAB.*) *Subject Heading:* **1. Weather sensitivity.**—*C.E.P.B.*

8K–54 551.586:612

Hentschel, G., **Die endogenen und exogenen Anteile des "Empfinduntsklimas."** [The edogenous and exogenous parts of sensible climate.] *Angewandte Meteorologie*, 1(11):321–332, Nov. **1953.** 10 figs., table, 18 refs. **DLC**—Relations of sensible temperature to cooling power by katathermometer or frigorimeter, given by different authors, vary greatly, owing to complex physiological factors. Observations with 114 persons on 16 point scale (unbearably hot to unbearably cold) are analyzed according to sex and age, time of day and season, and according to temperature,

wind force, state of ground and cloudiness. Results are shown in diagrams and tabulated. Increased sensitivity to external cold was found in youths and elderly persons, and a decrease in afternoon (less marked in women). The external factors differed from those affecting cooling power, wind strength and humidity proving relatively unimportant. A "sensible" climatology is required. (*Same item as* 5.6–268, June 1954, *MAB.*) *Subject Headings:* **1. Cooling power 2. Comfort zones.** —*C.E.P.B.*

8K–55 551.586:612.2

Hentschel, Gerhard, **Physiologisch wirksame Phasen bei meteorologischen Vorgängen in der Troposphäre.** [Physiologically effective phases in meteorological processes in the troposphere.] *Germany. Deutsche Demokratische Republik. Meteorologischer und Hydrologischer Dienst, Abhandlungen,* 4(31), **1954.** 30 p. 7 figs., 24 refs. **DWB**—Technique of tracing physiological reactions to atmospheric processes is discussed. Surface and upper wind, cloud type and temperature gradient (Wernigerode and Brocken) are compared with bodily and mental well-being. Some of the relations are statistically real. Depression comes with showery weather or thunder, light winds and temperature gradient $\geq 7°C/100$ m. Favorable are superadiabatic gradient and upper föhn. Profiles of R.H. and temperature up to 500 mb indicate that vertical air mass exchange extending to ice level is unfavorable, but mixing in a homogeneous mass is favorable to well-being. The numerous hypotheses as to how these conditions act on body and mind are discussed, but data must be more closely investigated. (*Same item as* 6.1–316, Jan. 1955, *MAB.*) *Subject Heading:* **1. Weather sensitivity.**—*C.E.P.B.*

8K–56 551.586:599.9

†Herrington, L. P. (*Yale Univ.*), **Biophysical adaptations of man under climatic stress.** *Meteorological Monographs,* Boston, 2(8):30–42, Oct. **1954.** 5 figs., 6 tables, 28 refs., eqs. **DWB**—"The principal features of man's adaptation to climate are described as a special case of the broader biological problems of achieving a common standardized body temperature in animals of greatly different tissue mass. The biophysical consequences of a variable temperature environment are then considered with respect to the relative efficiency of adaptation by increased heat production, development of peripheral insulation and utilization of thermal capacity properties as these efficiencies change with tissue mass." The author discusses the constitutional adjustments of the animal body to habitat temperature as indicated in studies on mice; the interrelationship among body mass, thermal equilibrium, time and the diurnal temperature stimulation coefficient; the energy costs of cold stress as related to the life span of human beings; the biophysical characteristics of human thermal interchange with the environment through radiation, convection, evaporation and conduction; the physiological response of the human body to heat; the upper limits of evaporation regulation, physiological response to cold stress, water balance and endocrine changes; dietary requirements under climatic stress; local skin response to cold; and fatal exposure to cold. (*Same item as* 6.8–319, Aug. 1955, *MAB.*) *Subject Headings:* **1. Climatic stress 2. Acclimitization 3. Heat tolerance.**—*I.L.D.*

8K–57 551.521.64:551.586

†Hess, Victor F. and Eugster, Jakob, **Cosmic radiation and its biological effects.** 2nd ed. New York, Fordham Univ. Press, **1949.** 178 p. 32 figs., 6 tables, numerous refs., eqs. **DLC**—This monograph is a complete review of the physics of cosmic radiation and of its effect upon living tissues. Hess discusses the physics of cosmic radiation in chapters dealing with methods of measurement, distribution of intensity and of the direction of cosmic radiation in the atmosphere and below the surface of the earth, geographic distribution of cosmic ray intensity and influence of the earth's magnetic field, the energy spectrum of cosmic rays, the interaction of cosmic rays with matter, variations of cosmic rays with time (temperature effect, diurnal variations with solar and sidereal time and seasonal time, etc.) and the composition and origin of cosmic radiation. Eugster reviews the literature on the effects of cosmic radiation upon the growth of unicellular organisms, upon the mutation rate of *Drosophila melanogaster* and upon cancer incidence in mice. He also describes his own experiments on the effect of cosmic ray showers upon living organisms. The author concludes that cosmic radiation has a definite effect upon living tissues; it is characterized by an initial stimulation of growth followed by an inhibitory phase—and that it stimulates tumor growth in white mice. A mechanism for the biologic action of cosmic rays is described. (*Same item as* 2.9–97, Sept. 1951, *MAB.*) *Subject Headings:* **1. Cosmic radiation 2. Biological effects of cosmic radiation.** —*I.L.D.*

8K–58 551.586:616.12

Heyer, Howard E.; Teng, H. C. and Barris, William, **The increased frequency of acute myocardial infarction during summer months in a warm climate: a study of 1,386 cases from Dallas, Texas.** *American Heart Journal,* St. Louis, 45(5):741–748, May **1953.** 2 figs., 2 tables, 27 refs.

DLC—A survey of the monthly and seasonal frequency of occurrence in a series of 1386 cases of authenticated myocardial infarction in Dallas, Texas, showed that the greatest number of cases occurred during the summer months and the lowest during the winter months. The increased summer frequency of this disease differs entirely from reported seasonal incidence in northern U. S. cities where the greatest number of cases are found during the winter months. A table contains a summary of the monthly incidence of myocardial infarction reported in previous studies. *(Same item as* 7.8–244, Aug. 1956, *M.A.B.)* *Subject Heading:* **1. Temperature effects on heart disease.** —*I.L.D.*

8K–59 **551.586:312.26**

Hisdal, Vidar. **The influence of weather on mortality.** *Meteorologiske Annaler*, Oslo, 3(10):257–283. **1953.** 8 figs., 7 tables, 11 refs. **DWB**—Using the mortality statistics of Oslo for the period 1934–38, the author with the aid of statistical tests such as the chi-square test and t-distribution, analyzed the relationship between mortality and: 1) interdiurnal change of temperature and 2) frontal passage. A day with an appreciably higher mean temperature than the previous day is likely to have a higher mortality than a day with a drop in the mean temperature. A day with a marked change of air masses caused by the passage of a cold front is apt to be connected with a higher death rate than the two preceding or following days. *(Same item as* 7.8–243, Aug. 1956, *M.A.B.)* *Subject Headings:* **1 Mortality due to weather 2. Oslo, Norway.**—*I.L.D.*

8K–60 **551.515.8:577.39**

Horváth, László Gábor, **Frontátvonulások hatása a közlekedő ember idegtevékenységére.** [Effect of frontal passages on the nervous reactions of persons in traffic.] *Időjárás*, Budapest, 59 3 :139–147, May June **1955.** fig. Russian and German summaries p. 139. **DWB, DLC**—Detailed report on results of a study made at the traffic aptitude testing establishment of the Hungarian State Railway. The study comprised (a) testing of the reactions of railway personnel under laboratory conditions and comparison with weather data, b) calculation of the correlation of accidents and frontal passages during a one-year period. Both cold and warm fronts are found to have an adverse effect on the reflexes of traffic personnel. The effect of cold fronts is *equally* marked in the four hours *preceding* and the four hours *following* their passage, while the effect of warm fronts is most noticeable *before* their passage. *Subject Headings:* **1. Frontal effects on nervous reactions 2. Frontal effects on traffic accidents.**—*G.T.*

8K–61 **551.515.8:656.08**

Horváth, László Gábor. **Az időjárásváltozások és az ipari balesetek.** [Weather changes and accidents in industry.] *Időjárás*, Budapest. 60 2 :88–96, March April **1956.** 5 tables, 6 refs. Russian and English summaries p. 88. **DLC**—The 604 accidents which occurred in 1954 in two large industrial plants in Budapest are investigated as to their connections with the passage of atmospheric fronts. A very close connection is found: frontal passages being linked to a remarkable accumulation of accidents during the time interval of ±36 hours, mainly in the case of persons with a weak nervous system. *(Same item as* 8.5–118, May 1957, *M.A.B.)* *Subject Headings:* **1. Frontal effects on industrial accidents 2. Budapest, Hungary.**—*Author's abstract.*

8K–62 **551.586:616**

Horváth, László Gábor *(Hungarian State Railways Aptitude Testing Station)*, **Az időjárásváltozás hatása a központi idegtevékenység időviszonyaira.** [The effect of weather changes upon the time element in reactions of the central nervous system.] *Időjárás*, Budapest, 61 (1):29–40, Jan.–Feb. **1957.** 2 figs., 5 tables. English summary p. 29. **DLC**—Time of reaction to visual signals was measured under laboratory conditions with several individuals. Details of the experiments are discussed. Connections between changes in reaction time and different meteorological elements are analyzed statistically. Definite relationships are found between reaction time and frontal passages, air masses, wind and temperature. Cold-front passages had the strongest effects. *Subject Heading:* **1. Weather effects on nervous reactions.**—*G.T.*

8K–63 **551.586:551.594**

Israël, Hans, **Die Luftelektrizität im Rahmen der Bioklimatologie, Vorträge und Diskussionen zum obigen Thema am 6 7 März 1951 in Buchau a.F. und Schussenried.** [Atmospheric electricity in the sphere of bioclimatology. Lectures and discussions . . . at Buchau and Schussenried.] *Angewandte Meteorologie*, 1 3 :65–79, Dec. 1951. **Pt. 2.** *Ibid.*, 1 4):97–104, Jan. **1952. DLC**—H. Israel discusses the difficulties inherent in research in bioclimatology, both from the biological and physical aspects and summarizes the electrical properties of the atmosphere. The latter includes an account of the mean atmospheric level of the atmosphere, periodic variation of atmospheric electricity such as diurnal and annual aperiodic variations and their relation to humidity, temperature, cloudiness, wind, etc. It is stated that slow variations of the atmospheric electricity

field—oscillation of 1 sec or longer—have no direct bioclimatic influences upon the human organism since they are present within enclosed spaces. The same is true of the vertical current. Within rooms only one element of the atmosphere shows variations, namely aerosol conditions of the air. G. MALL in **Elektro-biologische Probleme der Medizin und Konstitutionsforschung** offers some general remarks on the relationship of constitution types (KRETSCHMER) to atmospheric electricity effects and the pH balance of the body. In **Einzelfragen zur Wetterfühligkeit**, H. WACHTER discusses weather influences in general terms. F. BECKER in **Erfahrungen mit dem Bioklimagramm** summarizes briefly the method involving the recording of all weather phenomena in minute detail and their correlation with biological phenomena. (*Same item as* 4.2–278, Feb. 1953, *MAB.*) *Subject Heading:* **1. Atmospheric electricity effects on biological processes.**—*I.L.D.*

8K–64 551.586:616.3(439.1)

†Jáki, J. (*Univ. Debrecen*), **Wurmfortsatzentzündung und Witterung.** [Appendicitis and weather.] Budapest, Carl Rényi, **1943.** 78 p. 8 figs., tables, bibliog. p. 76–78. **MH-BH**—A thorough and critical review of all the available literature on the relation between appendicitis attacks or deaths and weather or season, followed by a critique of the logical and methodical errors perpetrated by each of these authors: MILLS, PETERSEN, DE RUDDER, DÜLL, and many others, and a statistical study of 2185 cases of acute appendicitis which occurred at Debrecen during 10 years in relation to year, season and frontal passages (weather). Although other authors concluded that a decided, positive seasonal or meteorological correlation was established, the evidence of these authorities is completely conflicting. The conclusion is that the apparent seasonal (spring, summer or fall maximum as the case may be) or frontal (warm or cold or warm and cold front) relations are due to other factors (such as dietary habits) which are seasonal, or to careless statistical methods. (*Same item as* 5.4–235, April 1954, *MAB.*) *Subject Headings:* **1. Weather effects on appendicitis 2. Appendicitis.**—*M.R.*

8K–65 551.5:616:519.2

†Jessel, U., **Bemerkungen zur medizin-meteorologischen Statistik.** [Remarks on medical meteorological statistics.] *Annalen der Meteorologie, Medizin-Meteorologische Hefte*, No. 9:7–20, **1953.** 2 figs., 28 refs., eqs. **DWB**—Author criticizes some of the statistical methods used in recent meteoro-biological research. He deals with probabilities of 0, 1, . . . occurrences computed from BERNOULI's law, comparison of frequencies, testing significance of relations found by the n-method, methodology of overlapping group formation (running means), coincidence of biological and meteorological phenomena and resulting spurious correlations. Each section is illustrated by examples drawn from the literature. The statistical basis of many commonly believed relations between weather and disease is insufficient. An extensive bibliography is presented. (*Same item as* 5.8–17, Aug. 1954, *MAB.*) *Subject Headings:* **1. Statistical methods in medical meteorology 2. n-method.**—*C.E.P.B.*

8K–66 551.515.8:616.926

John, H., **Über die meteorotrope Abhängigkeit der Poliomyelitis im Gebeit der Oberlausitz.** [The meteorotropic dependence of poliomyelitis in the Oberlausitz region.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, Vienna, 7(2):277–285, **1956.** 4 figs., 3 tables, 26 refs. German, English and French summaries p. 277–278. **DWB**—Previous investigations into relation between poliomyelitis and passage of fronts are summarized, showing diversity of results. Author found that at Oberlausitz, 1948–1950, beginning of illness is closely related to the passage of cold fronts, whereas warm fronts were probably ineffective. No relation was found between onset of paralysis and any weather phenomena. (*Same item as* 7.9–155, Sept. 1956, *MAB.*) *Subject Headings:* **1. Frontal effects on poliomyelitis 2. Poliomyelitis 3. Oberlausitz, Austria.**—*C.E.P.B.*

8K–67 551.586:616

Kaiser, M., **Virusinfekte und Wetter.** [Virus infections and weather.] *Wetter und Leben*, Vienna, 6(10/12):222, **1954.** **DWB**—A quotation from the article **Zur Frage der Encephalitis post vaccinationem** [Encephalitis following vaccination] by Albert Hofbauer. *Zeitschrift für Kinderheilkunde*, 10(3/4), **1954.** **DNLM**—The virus infections manifest a distinct relationship to weather. The cases recorded appeared in localities at the same elevations situated in winter at the upper boundary of the ground fog and in summer are subject to the influence of the föhn wind. (*Same item as* 7.7–247, July 1956, *MAB.*) *Subject Headings:* **1. Weather effects on virus infections 2. Encephalitis.**—*I.L.D.*

8K–68 551.586:612

Kanz, Ewald, **Biologische Messmethoden in der Meteorobiologie.** [Biological methods of measurement in meteorobiology.] *Annalen der Meteorologie, Medizin-meteorologische Hefte*, No. 6:34–37, **1951.** 5 figs. **DLC**—The possible effect of weather elements upon various sensory organs

was investigated. A modified Grazzi-method was used to study the variation of the sense of smell. As a result of daily tests on four persons for several months it is concluded that with increasing relative humidity, olfactory sensations become more acute. The threshold of hearing agreed with the conductivity of air and bones and increased during the passage of fronts. The sense of touch was tested by those methods and was found to be dominated by temperature. The sense of taste, tested by various concentrations of NaCl, was influenced by storms and was related to the ozone concentration. (*Same item as* 3.4–239, April 1952, *MAB.*) *Subject Headings:* **1. Frontal effects on olfactory sensation 2. Temperature effects on touch sensation 3. Ozone effect on taste.**—*I.L.D.*

8K–69 551.586:616.16

Kanz, E.; Netzle, P. and Dirnagl, K., **Experimenteller Beitrag zur kapillarmikroskopischen Untersuchung der Wetterbeeinflussung des Organismus.** [Experimental contribution to capillary microscopic investigation of weather influence upon the organism.] *Deutsche Medizinische Wochenschrift*, 25:1213–1271, **1952.** ref., 7 figs. **DNLM**—The variation of capillary resistance, skin temperature, pressure sensation threshold, hand volume, blood pressure and pulse rate were studied for 75 days on six subjects. Simultaneous tests of surface and depth sensitivity were tested by sand paper test, skill by means of the fall test and accuracy by the tremometer. Capillary flow was measured in the middle of the fifth finger of the left hand. Flow velocity in the capillaries proceeded parallel to the cooling conditions. Capillary width showed no relationship to the flow velocity. No unequivocal relationship could be established between change in capillary width and specific weather types. *Subject Heading:* **1. Weather effects on capillaries.**—*I.L.D.*

8K–70 551.586:616

Kayser, Paul-Henning, **Die Witterungsabhängigkeit von Thrombose, Embolie und Apoplexie.** [Dependence of thrombosis, embolism and apoplexy upon weather.] *Virchows Archiv f. Pathologische Anatomie . . . .*, Berlin, 302:210–221, **1938.** 4 tables, ref. **DNLM**—253 cases of thrombosis, fulminating embolism and apoplexy, the occurrence of which was determined both clinically and morphologically, were studied in relation to the meteorological milieu. The occurrence of thrombosis and apoplexy is influenced more by warm fronts than by either cold fronts or föhn. Periods with weather are relatively free from thrombosis, embolism and apoplexy. During these periods, postmortems are made chiefly on cancer and infectious diseases. Seasonal variation in the occurrence of thrombosis, embolism and apoplexy during particular weather conditions were not observed. Thromboses are seen seldom in regions with continental climate. Weather sensitive patients respond to every weather disturbance with a pathological reaction. Atmospheric electricity is considered to be the causal element in weather effect. *Subject Headings:* **1. Weather effects on disease 2. Thrombosis.**—*Based on author's abstract.*

8K–71 551.515.8:312.26

Kérdő, I., **Neuere Untersuchungen über die Wirkung der Frontendurchgänge auf den Eintritt des Todes.** [Recent investigations on the effect of the passage of fronts on the occurrence of death.] *Wetter und Leben*, 2(1–2):16–23, May **1949.** 2 figs., table. **MH-BH, DLC**—Using the N-method developed by De Rudder, the author investigated the relationship of 161 deaths which occurred in Budapest over a period of 20 months to the passage of fronts (a total of 1014 frontal passages). By dividing the time into eight hour intervals and disregarding the 24 hour day it is shown that a statistically significant excess of deaths occurred during the eight hours which included a frontal passage, either cold or warm front. The possibility is suggested that disturbances in atmospheric electricity processes, such as conductivity of the atmosphere, might influence the nervous system and thereby cause death. (*Same item as* 9–72, Sept. 1950, *MAB.*) *Subject Headings:* **1. Frontal effects on mortality 2. Mortality due to weather.**—*I.L.D.*

8K–72 551.586:612.275

Kérdő, István, **Összefüggések az asthmás rohamok és a levegőfajták között.** [Correlation between attacks of asthma and air-mass types.] *Időjárás*, 56(11/12):338–346, Nov./Dec. **1952.** fig., 4 tables, 18 refs., 5 eqs. Russian and German summaries p. 391–392. **DLC**—Four hundred and eighty-eight attacks of asthma observed in a patient during 188 consecutive days are correlated with accompanying air masses. In a detailed statistical study the author examines several aspects of the correlation. Although cold continental air masses appear to promote susceptibility to attacks, while modified continental air would seem to reduce it, no correlation can be established on a sufficient level of significance. (*Same item as* 5.2–279, Feb. 1954, *MAB.*) *Subject Headings:* **1. Air mass effects on asthma 2. Asthma.**—*G.T.*

8K–73 551.515.8:616

Kutschera, W., **Statistische Überlegungen zur Frage einer Frontenabhängigkeit des Herzinfarktes.** [Statistical considerations on the problem of the dependence of heart infarction upon

ronts.] *Wetter und Leben*, 5(8/10):149–152, Nov. **1953. DLC**—One hundred and thirty-four cases of myocardial infarction occurring over a period of 700 days in which 211 were characterized by fronts were analyzed statistically in order to determine the relationship between fronts and heart infarction. The classification of fronts into five groups depending upon intensity (used by the Bioclimatology Section of the Central Institute of Meteorology and Geodynamics in Vienna) was used. Fronts of the "O" type, the lowest degree of intensity, are shown to lack a biotropic effect. A further analysis of the variation of the incidence of heart infarction with different degrees of frontal intensity fails to reveal a clear dependence of myocardial infarction upon fronts. (*Same item as* 6.4–171, April 1955, *MAB.*) *Subject Headings:* **1. Frontal effects on myocardial infarct 2. Heart disease.**—*I.L.D.*

8K–74 616.925:551.5

Lawrence, E. N., **Poliomyelitis and weather.** *Meteorological Magazine*, London, 85(1008):164–167, June **1956.** fig., 4 refs. **DWB**—A succinct review of various studies carried out in England during the last decade or so on the relationship between epidemics of infantile paralysis and weather. On the basis of League of Nations epidemiological data, there was developed an empirical equation, giving the number of days after April when mean temperature = 55°F when cases attain a maximum, viz.: $Z = 0.63t + 138$ where t = number of days from April 1 to Z, when number of casesr each a maximum. Tentative conclusions indicate that there is a definite tendency for epidemics to begin after a spell of hot dry weather. A correlation of approximately 0.85 and 0.83 was found between "accumulated degree weeks" (computed from the weekly mean temperature in England and Wales calculated from a base of 60°F), biweekly, weekly and total annual cases of poliomyelitis. (*Same item as* 7.10–65, Oct. 1956, *MAB.*) *Subject Headings:* **1. Temperature effects on poliomyelitis 2. Poliomyelitis.**—*I.L.D.*

8K–75 551.586:551.594.11:550.387

Lossnitzer, H., **Die Bedeutung des elektromagnetischen Erdfeldes in der Bioklimatologie.** [The importance of the terrestrial electromagnetic field in bioclimatology.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 3:297–307, **1951.** 4 figs., 28 refs. German, English and French summaries p. 297. **DWB**—A number of studies on blood clotting indicate that ionic-electrical processes are of great importance in the mechanism of transmission between atmospheric processes and a living organism when the latter reacts to various weather phenomena. Accordingly, the author discusses the nature of terrestrial currents which consist of geomagnetic and geoelectric components. The influence of meteorological factors such as soil humidity upon the earth current, the influence of convection upon ionic transport on the atmosphere, the role of point discharge of static electricity in the atmosphere, measurement of the earth's current, the behavior of the earth current when measured in house plants, etc., are discussed. (*Same item as* 3.3–227, March 1952, *MAB.*) *Subject Headings:* **1. Atmospheric electricity effects on blood clotting 2. Atmospheric electricity 3. Earth currents 4. Blood clotting.**—*I.L.D.*

8K–76 551.586:612:636.92

Lotmar, R. and Häfelin, J., **Über den Einfluss der Witterung auf den Schwefelstoffwechsel von Kaninchen.** [On the influence of weather on sulfur metabolism in rabbits.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 7(1):133–145, **1955.** 4 figs., 3 tables, 24 refs. English and French summaries p. 133. **DWB**—During four months the urine of a certain number of rabbits, which had received radioactively marked sodium-sulfate ($Na_2S^{35}O_4$), has been examined daily as to its activity. It was found that on certain days the excretion of sulfur was distinctly above the normal value. This was the case on all cold front days, which had a polar air mass before as well as after their passage. The five cold fronts following a tropical air mass on the other hand produced no biotropic effect on the sulfur metabolism. (*Same item as* 7.5–228, May 1956, *MAB.*) *Subject Heading:* **1. Air mass effects on sulfur excretion.**—*Authors' abstract.*

8K–77 551.589.1:591.14 551.586:612

Lotmar, Ruth and Häfelin, Joh, **Über die Abhängigkeit der Hautpermeabilität von der Witterung (Versuche mit radioaktiv markiertem Natriumsulfat an Kaninchen).** [Dependence of skin permeability on weather (research with radioactive sodium sulfate markers in rabbits).] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, Vienna, 7(2):286–296, **1956.** 10 refs. German, French and English summaries p. 286. **DWB**—Authors had previously (*Arch. f. Met. Geoph. Biokl., Ser. B*, 7:133, **1955**; *see* 7.5–228, May 1956, *MAB*) found a clear correlation between sulfur excretion of rabbits and days of incursion of fresh polar air. In this investigation permeability of intact skin for radioactive sodium sulfate (S^{35}) is studied over 15 months. "On days without any fronts, and particularly on cold front days, values of low permeability were obtained, whereas on warm front days or under the influence of föhn, and especially in phases of occlusions, higher

degrees of permeability were obtained." (*Same item as* 7.9–246, Sept. 1956, *MAB.*) *Subject Heading:* **1. Air mass effects on skin permeability.**—*C.E.P.B.*

8K–78 551.586:612

Marchionini, A. and Sedan, Tor, **Zur Klimatophysiologie und -pathologie der Haut.** [The climatophysiology and pathology of the skin.] *Archiv für Dermatologie und Syphilis*, 179(4):421–461, **1939.** 22 illus., 6 tables, ref. **DNML**—The principles of climatic physiology and pathology of the skin are elaborated. It is defined as the study of those normal or pathological behavior of the skin produced by climatic stimuli. This study is based upon investigations carried out in central Anatolia in comparison with analogous conditions in other regions of Turkey characterized by an entirely different climate. The primarily climatically conditioned skin disease of central Anatolia is a form of Cheilitis which occurs exclusively during the summer months. Seventy new cases were observed during 1938 in the skin clinic at Ankara. The clinical course of this disease, its histology and healing processes are described. Also, the bacteria producing secondary infection were investigated. Summer Cheilitis is attributed to the interactions of a series of special climatic factors in central Anatolia and the prevailing UV radiations. The special climatic elements are unusually long sunshine duration, high summer temperatures, low atmospheric humidity and prevalence of dust. *Subject Headings:* **1. Weather effects on skin disease 2. Cheilitis.**—*I.L.D.*

8K–79 551.586:616.2

Markow, Harry and Reicher, Jacob, **The effect of meteorologic conditions on asthmatic patients.** *New York State Journal of Medicine*, 53(22):2675–2681, Nov. 15, **1953.** 7 figs., 34 refs. **DLC**—A review of the medical literature dealing with the effects of meteorological factors upon allergic patients over short periods of time and the report of a study in which the reactions of 90 perennially asthmatic patients were investigated in relation to temperature, relative humidity, barometric pressure and total rainfall are presented. The monthly averages of the patients' reactions indicate that no definite correlation exists between asthmatic symptoms and meteorological factors but they suggest a trend in relation to temperature, humidity and rainfall. (*Same item as* 7.8–245, Aug. 1956, *MAB.*) *Subject Headings:* **1. Weather effects on asthma 2. Asthma.**—*I.L.D.*

8K–80 551.586:612

Mőrikofer, Walter, **Zur Problematik der Wetterfühligkeit.** [On the problem of weather sensitivity.] *Annalen der Meteorologie, Medizin-meteorologische Hefte*, No. 5:18–20, **1951. DWB, DLC**—In this summary of present concepts of weather sensitivity, the author discusses the biological and meteorological criteria of weather sensitivity. The account includes the nature of meteorotropic weather situations, fronts, föhn, preföhn period, etc., criteria of weather sensitivity such as penetration cuts closed rooms, anticipatory phenomena and sensations of weather effects at a distance. Also hypotheses attempting to explain weather sensitivity are considered; these include composition of the atmosphere, rapid oscillations of the atmosphere, and oscillations in electric field intensity. (*Same item as* 2.10–173, Oct. 1951, *MAB.*) *Subject Heading:* **1. Weather sensitivity.**—*I.L.D.*

8K–81 551.521.64:551.586:616

Morris, P. A. and Nickerson, W. J., **Cosmic radiation and cancer mortality.** *Experientia*, Basel, 4(7):251–255, July 15, **1948.** 15 figs., 19 refs. **DWB**—A critical examination of statistical evidence for the existence of a correlation between total intensity of cosmic radiation and cancer mortality. Intensity of cosmic radiation increases with geomagnetic and geographic latitude and with altitude; total cancer mortality increases with geographic latitude, with degree of urbanization and apparently with altitude in the case of Switzerland. The primary radiation from cosmic rays is probably not different by an order of magnitude from the radiation received from natural sources to which the body is exposed. However, cosmic ray showers producing properties of ceilings, etc. might increase amount of radiation received by persons spending much time indoors. Skin cancer mortality increases with decrease in latitude but mortality from breast cancer, uterine cancer and liver biliary passage cancer show no relationship with latitude. The role of complicating clinical and racial factors in determining cancer incidence is discussed. (*Same item as* 4H–144, Aug. 1953, *MAB.*) *Subject Headings:* **1. Carcinogenesis 2. Biological effects of cosmic radiation.**—*I.L.D.*

8K–82 551.586:551.515.8:616.9

Mücke, Dietrich and Fieber, Sigrid, **Über die Auslösung der Diphtherie durch meteorologische Einflüsse.** [The causation of diphtheria by meteorological influences.] *Deutsche Gesundheitswesen*, 7:300–305, **1952.** 5 figs., 5 tables, 19 refs. **DNLM**—The seasonal incidence and mortality from diphtheria was investigated in 1382 cases that occurred over a period of 1330 days (1940–1943). Statistical examination of the data shows that warm fronts, cold fronts and occlusions have a more than random relationship with the occurrence of diphtheria. Furthermore, days with warm and cold front passages showed a distinct rise in the deaths from diphtheria. *Subject Headings:* **1. Frontal effects on diphtheria 2. Diphtheria.**—*I.L.D.*

8K–83 551.555 551.586:612.2

Myers, W. A. and Price, Saul, **Kona weather and the incidence of asthma in children in Honolulu.** *Hawaii Medical Journal*, 13:181–188, Jan./Feb. **1954.** 7 figs., 3 tables, 9 refs. Abstracted from reprint. **DNLM**—A brief summary of the literature on the effect of pressure, humidity, wind speed and direction and temperature upon the production of asthmatic symptoms is presented. The weather and climate of the Hawaiian Islands, in particular the Kona weather type, are discussed. The effect of Kona weather upon the manifestation of asthma is examined in a population of 1259 asthma cases and it is found that no definite relationship exists between Kona weather and asthma attacks. (*Same item as* 6.3–172, March 1955, *MAB.*) *Subject Headings:* **1. Kona weather effects on asthma 2. Asthma 3. Honolulu, Oahu.**—*I.L.D.*

8K–84 551.586:612

Nikogosian, KH. A., **Novyĭ metod gigienicheskogo izucheniia klimata.** [A new method of investigating the medical effects of climate.] *Gigiena i Sanitariia*, No. 2:16–20, Feb. **1951. DLC**—The human organism adapts itself to periodic climatic changes by establishing corresponding physiological rhythms. Nonperiodic climatic changes produce physiological strain. The variations of specific combinations of meteorological elements within a brief interval of time (not more than 24 hours) constitute weather types and are the result of changing air masses. The various weather types and the frequency of change determine the condition and reactions of human organisms. The following climatic features must be studied: the types of weather at a given locality; frequency of change of weather type; frequency of occurrence of various weather types; duration in days of weather types; frequency of transition of one type into another; the quantitative qualitative characteristics of the meteorological elements constituting each weather type. This method was applied to a study of the climate of Kishinev. It was found that seasons or months which were considered favorable by the accepted climatic classification may be unfavorable and productive of physiological strain according to the new system proposed. (*Same item as* 2.9–160, Sept. 1951, *MAB.*) *Subject Heading:* **1. Physiological climatology.**—*I.L.D.*

8K–85 551.586:612.67

Obenland, E., **Untersuchung über die Wetterabhängigkeit des Todeseintritts.** [Investigation of the weather dependence of time of death.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 6(3):292–316, **1955.** fig., 8 tables, 11 refs. German, English and French summaries p. 292–293. **DWB**—The relationship between weather and death was studied by using 1257 cases of deaths recorded officially in Sonthofen (Allgau) during 1951–1952, and the weather at the same locality. When deaths are correlated with weather phenomena occurring on the same day or within several hours of the reported deaths, the correlation is found to be within the limits of random error for the increase of death during upglide motion, cold front, occlusion and the diminution during cyclonic föhn. When the *n*-method is employed and deaths and weather are more closely related in time, significant correlations are found between death and cold fronts, passages and labile situations. A statistically significant increase in deaths precedes warm fronts and incursion of föhn. Cold fronts, occlusions and unstable weather influence the incidence of death more than do warm fronts and cyclonic föhn. It was also found that days with beginning perturbation of weather after an anticyclonic phase show a significant increase in the number of deaths. (*Same item as* 6.8–321, Aug. 1955, *MAB.*) *Subject Headings:* **1. Mortality due to weather 2. n-method.**—*Author's abstract & I.L.D.*

8K–86 551.586:616.2

Ordman, David, **Graphical method of comparing climates in the study of perennial respiratory allergy.** *South African Journal of Science*, Johannesburg, 51(6):187–189, Jan. **1955.** 4 figs. **DWB**—Experience has shown that the incidence of perennial respiratory allergy—bronchial asthma and allergic sinusitis and rhinitis—is considerably higher in the coastal than in the inland areas of southern Africa. Sufferers at the coast tend to improve on moving inland and patients inland to become worse on the coast. The difference in climate appears to offer an explanation in many of these cases. The significant climatic factors involved are considered to be high relative humidity in combination with high temperature. Diagrams showing the average monthly relative humidity and temperature data for morning and afternoon reveal climate patterns which are significantly different for coastal and inland towns. These climate patterns may guide the physician in regard to climate in his therapeutic approach to his patients with perennial respiratory allergy. Although the climate patterns described are regarded essentially as of value in respiratory allergy studies, similar patterns based on the same or other climatic data will, it is thought, be of value in the study of other respiratory diseases and of ecological problems. (*Same item as* 6.11–345, Nov. 1955, *MAB.*) *Subject Headings:* **1. Respiratory allergies 2. Climatotherapy 3. Allergic sinusitis 4. Allergic rhinitis 5. South Africa.**—*Author's abstract.*

8K–87 551.586:599.9

†Pfleiderer, H. and Büttner, K. **Bioklimatologie.** [Bioclimatology.] In **Lehrbuch der Bäder- und Klimaheilkunde,** Heinrich Wilhelm Vogt (ed.). Berlin, Springer, 1940. p. 609–949. numerous figs., tables, refs and eqs. DLC—This is a comprehensive discussion of the influence of climate upon man as a biological organism. It presents the state of knowledge on this subject as it existed in 1939. The concepts of bioclimate and resort, healing, stimulating, relaxing climates, etc., are defined and the processes of weather formation are surveyed. The following topics are considered extensively: the types and properties of therapeutic climates; the properties of temperature, wind, pressure, humidity, precipitation, clouds and radiation and their effects upon the human organism; heat regulation of man; biological effects of atmospheric gases, ions, aerosols, aerosol climate and of electromagnetic phenomena; various influences and pathological conditions produced by weather; effect of weather and climate upon constitutional types; the action of weather and climatic changes upon growth, metabolism, respiration, circulation, work performance, composition of the blood, acid-base equilibrium, etc. Extensive bibliographies are given. *Some item as 2.1–173, Jan. 1951, M.A.B.) Subject Headings:* 1. Medical meteorology 2. Climatotherapy.—*I.L.D.*

8K–88 551.586:616

†Raettig, H. and Nehls, E. **Die Meteorotropie der Lungenembolie unter besonderer Berücksichtigung der Arbeitsmethode.** [Meteorotropism of pulmonary embolism with particular consideration of the method of investigation.] *Zeitschrift für Klinische Medizin.* 138 2):242–268. 1940. 10 figs., 8 tables, refs. DNLM—489 cases of pulmonary embolism which occurred during the period 1925–1935 in Greifswald were investigated in relation to the prevailing weather types at the time of occurrence of embolism. Nine weather types are described; these are based upon the occurrence of cold or warm fronts, cyclonicity, air mass, etc. Evidence is presented indicating that pulmonary embolism is a meteorotropic disease. While the degree of meteorotropism is slight, it is clear that days with unstable weather are characterized by a greater incidence of embolism. Cold fronts are more predisposing than warm fronts, while occlusions are not meteorotropic. This is a detailed statistical study and includes an analysis of seasonal incidence of pulmonary embolism, influence of weather upon embolism occurrence on the operation day, etc. The literature is reviewed and an extensive bibliography is appended. *Subject Headings:* 1. Weather effects on pulmonary embolism 2. Pulmonary embolism.—*I.L.D.*

8K–89 551.586:617

Rapport, E. **Chirurgie und Wetter.** [Surgery and weather.] *Die Medizinische Welt.* No. 46:1655–1656. 1935. DNLM—The author found that 90% of acute diseases occur during frontal change and 10% during periods of unchanging weather. He collected 1004 cases of acute appendicitis. The Wiener Krankenstatistik classified them into 20 groups and found that 16 groups with 210 cases occurred on days with frontal passages while four occurred on days with indifferent weather. In order to exclude the mean error as much as possible only day groups with at least 6 cases were used. Similar results were obtained also in the investigation of other acute inflammatory diseases and post-operative complications. *Subject Heading:* 1. Weather effect on surgical operations. —*I.L.D.*

8K–90 551.555.3:551.586

Regener, Erich. **Zur Erklärung der physiologischen Wirkung des Föhns.** [Explanation of the physiological effect of föhn.] *Naturwissenschaften.* 29 2):30–31. Jan. 10. 1941. 2 tables, 8 refs. DLC—During föhn weather there is a simultaneous manifestation of physiological reactions in individuals responding to föhn effects and a decrease in the water vapor content of the atmosphere. The latter is accompanied by an increase in the O_2 content of the atmosphere and in its partial pressure. Föhn symptoms are ascribed to increased O_2 content of the atmosphere. The pros and cons of this hypothesis are discussed briefly. *[Some item as 2G–253, July 1951, M.A.B., Subject Heading:* 1. Föhn sickness.—*I.L.D.*

8K–91 551.586:616.14

Regli, Josef and Stampfli, Robert. **Die Kapillarresistenz als objektives Mass für die Wettereinflüsse auf den Menschen.** [Capillary resistance as an objective measure of weather effects upon man.] *Helvetica Physiologica Acta.* 5 1):40–63. 1947. 8 figs., tables, refs. DNLM—Capillary resistance measurements in a foehn wind locality of the canton Uri, Rynfeld, were compared with weather map analyses of professional meteorologists. During an experimental period of 47 days, 1600 measurements obtained from 37 children and 3 adults were analyzed statistically. The suction procedure was used. The capillary resistance does not vary significantly in a high pressure period of 8 days. This period is therefore designated as the normal period and is compared with a reaction period of 39 days. Warm fronts greatly lower capillary resistance corresponding to an increase in the tonus of the parasympathicus. Cold fronts increase capillary resistance corresponding to an

ıcrease in the tonus of the orthosympathicus. Föhn is supposed to be associated with an increase ı capillary resistance in the preföhn period and a slight lowering of its capillary resistance during ıe actual incursion of the föhn wind. The capillary resistance of all experimental subjects appears) be weather sensitive but in differing degrees. The individual scatter during the reaction period , used as a measure of weather sensitivity. Subjective föhn sensitive subjects are all in the group 'hich is more than average sensitive. There are also individuals whose capillary resistance reacts .rongly to the weather phenomenon but are not subjectively weather sensitive. *Subject Headings:* **. Frontal effects on capillaries 2. Föhn effects on capillaries 3. Capillary resistance.**—*I.L.D.*

8K–92 551.586:612:551.594.1

Reiter, Reinhold. **Luftelektrische Elemente und biologische Reaktionen an Tagen mit kosıischen Störungen.** [Atmospheric electricity and biologic reactions on days with cosmic disurbances.] *Wetter und Leben*, Vienna, 3 11 12):248–251, Dec. 1951. 2 figs., 3 refs. **DLC**—The uthor plotted curves of hourly sequence of chromospheric disturbances in H_α days with magnetic isturbances and days with sudden appearance of sun spots parallel with curves of simultaneous neasurements of skin resistance on patients and on normal individuals, with curves of weather comlaints of patients with brain injuries, with curves of limb sensations in amputees and with curves f traffic accidents in Munich. He believes to have established a definite positive relationship etween atmospheric electricity and the various biological phenomena, but these positive correlations re occasionally masked by other correlations which are ultimately of astrophysical origin. *Same ıem as* 3.11–249, Nov. 1952, *M.A.B.*) *Subject Headings:* **1. Atmospheric electricity effects on bioogical processes 2. Austria.**—*I.L.D.*

8K–93 551.586:551.594

Reiter, Reinhold. **Bio-meteorologische Indikatoren von grossräumiger und prognostischer Bedeutung.** [Bio-meteorological indicators of large scale and prognostic importance.] *Germany, Deutscher Wetterdienst in der US-Zone, Berichte*, No. 35:235–253, 1952. 19 figs., table, 22 refs. **DWB**—Biometeorological indicators facilitate the determination of the magnitude of the biological tructures of a weather situation prevailing over a large geographical area and the evaluation of the iological stimulus of this weather situation 8–12 hours in advance. The effectiveness of a particular ndicator is limited by a particular number of biological functions. The following biometeorological ndicators have proven valid: infralong-wave disturbances of the atmosphere in region I 10–50 :Hz); infralong-waves in region II (5–12 kHz); and the static atmospheric electricity field and its emporal variations and disturbances. These facts are based on some 100,000 observations. The nfralong-wave disturbances recorded by an oscillograph indicate that those of region I and II are ndependent of each other. The disturbances of region I indicate the actual presence of thunderstorm, a storm or shower activity at a distance of several hundred kilometers. Disturbances of egion II forecast the occurrence of thunderstorm or showers several hours in advance. Curves show ı parallel sequence between region I disturbances and transportation accidents in Munich and Bavaria. When region II disturbances and transportation accidents are compared, it is found hat the maximum number of accidents occurs 12 hours after the disturbances. Reaction time of nan shows an analogous behavior. By means of static atmospheric electricity measurements it s possible to determine the formation of inversion instabilities over large areas. Their biometeoroogical conditions are analyzed. This article is followed by an extensive discussion of its contents by various authors. (*Same item as* 4.1–246, Jan. 1953, *M.A.B.*) *Subject Headings:* **1. Weather effects on traffic accidents 2. Weather sensitivity 3. Atmospheric electricity effects on traffic accidents.**—*Author's abstract & I.L.D.*

8K–94 551.586:551.515:656.08 551.586:551.594.9:656.08

Reiter, Reinhold. **Verkehrsunfallziffer und Reaktionszeit unter dem Einfluss verschiedener meteorologischer, kosmischer und luftelektrischer Faktoren.** [Traffic accident statistics and reaction time under the influence of different meteorological, cosmic and atmospheric-electric factors.] *Meteorologische Rundschau*, 5 1 2):14–17, Jan. Feb. 1952. 8 figs., 10 refs. **DWB**—Statistics of 21,000 traffic accidents and 45,000 reaction times of men, in Bavaria, were compared by n-method with weather conditions. Besides a weekly rhythm, results showed positive correlation of accidents with fog, heavy rain or snow, and of both accidents and reaction times with magnetic and electric infra-long wave) disturbances. The last are regarded as an important bioclimatic indicator. No relations were found with sunshine, föhn or cosmic factors. (*Same item as* 3.9–216, Oct. 1952, *M.A.B.*) *Subject Headings:* **1. Weather effects on traffic accidents 2. Cosmic influences on traffic accidents 3. n-method.**—*C.E.P.B.*

8K–95 551.586:612.2:551.594

Reiter, Reinhold. **Neuere Untersuchungen zum Problem der Wetterabhängigkeit des Menschen.** [Recent investigations in the problem of the dependence of man upon weather.] *Archiv für Meteoro-*

logie, Geophysik und Bioklimatologie, Ser. B, 4 (3) :327–377, **1953.** 14 figs., 5 tables, 75 refs. German, English and French summaries p. 327–329. **MH-BH**—After considering some fundamental problems of biometeorological research, the author discusses the use of climatic indicators in the study of biological reactions to weather conditions. These indicators are the static atmospheric electricity field and its temporal variations in so far as it deviates from the diurnal course and electromagnetic radiations in the atmosphere in the range of the longest wave, termed by the author "infralongwave" disturbances—actually wave region I with 10 to 50 kHz and infralongwave radiations of Region II with 4 to 12 kHz. The paper includes the following: the scale of temporal variations of atmospheric processes and their penetration into closed space; range of atmospheric electricity at various localities; behavior of atmospheric electricity during different aerosol conditions in the presence of moving cold air along the surface, etc.; field and antennal currents during föhn situations; the relationships of infralongwave to meteorological processes; an analysis of the relationships between bimeteorological indicators and pathological reactions, including the direction of reaction time, complaints of amputees and brain-damaged individuals; the effect of these indicators upon the time and course of birth; the relationships of the indicators to suicides, to felonies and to transportation accidents; and the diurnal significance of biometeorological indicators. The statistical analysis consists of a juxtaposition of parallel curves. (*Same item as* 4.8–246, Aug. 1953, *MAB.*) *Subject Headings:* **1. Weather sensitivity 2. Atmospheric electricity effects on biological processes.**—*I.L.D.*

8K–96 551.586:612:551.594

Reiter, Reinhold, **Schmerzempfindung und Wetter. Ein Nachtrag zur Arbeit von K. Brunnhölzl, F. Schiedel und H. Ungeheuer.** [Pain sensitivity and weather. Supplement to the work by . . .] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 5 (1) :112–113, **1953.** fig., 2 refs. **DWB**—In connection with the study of BRUNNHÖLZL et al. (*Ibid.*, 4:317, **1953,** *see* 8K–18) on pain sensation and weather, the author plotted the data of interdiurnal variation of pain sensitivity and the interdiurnal variation of the characteristic numbers of disturbances in infralongwave radiation I and II. The curves obtained are parallel and resemble those in which pain sensitivity was plotted against RBW. (*Same item as* 5.2–277, Feb. 1954, *MAB.*) *Subject Heading:* **1. Weather effects on pain sensitivity.**—*I.L.D.*

8K–97 551.594.2:538.56:551.586

†Reiter, Reinhold, **Gibt es einen direkten Kausalzusammenhang zwischen raschen elektrischen oder elektromagnetischen Feldänderungen und biometeorologischen Reaktionen?** [Is there a direct causal relationship between rapid electric or electromagnetic field changes and biometeorological reactions?] *Annalen der Meteorologie, Medizin-Meteorologische Hefte*, No. 9:35–59, **1954.** 12 figs., 2 tables, 114 refs. **DWB, DLC**—Author summarizes literature of possible physiological effects on shortwave radiation. He describes his data on: A) static electric field, its disturbances and vertical currents, B) short period impulses of 10–50 kHz and C) of 4–12 kHz, and quotes examples of associated weather and biological effects. The highest correlations are between A and amputation aches (0.97), B and general weather complaints (0.88), C and brain contusion pains (0.88) and traffic accident statistics (0.85). He discusses possible causes of connections between these "indicators" and meteoro-pathological effects very fully and brings experimental evidence that the "indicators" are actually the real causes, acting on cell membranes and organic colloids, e.g., in blood. Finally, he examines and extends work of FINDEISEN (*Bioklimatische Beiblätter*, 10:23, **1943**) on conductivity of solution of As_2S_3 on disturbed and undisturbed days. The bibliography is very extensive. (*Same item as* 5.8–278, Aug. 1954, *MAB.*) *Subject Headings:* **1. Atmospheric electricity effects on biological processes 2. Bioclimatology bibliographies.**—*C.E.P.B.*

8K–98 551.586:616

Réthly, Endre, **Beziehungen der ansteckenden Krankheiten zur Witterung mit besonderer Berücksichtigung der Heine-Medinschen Epidemien in Ungarn in den Jahren 1931–1947.** [Relations of infectious diseases to weather with special reference to the Heine-Medin epidemics in Hungary 1931–1947.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 2 (3) :279–290, **1950.** 3 tables, 13 refs. German, English and French summaries p. 279–280. **DWB**—A brief discussion of the relationship between climate and weather and the occurrence and spread of infectious and non-infectious diseases is followed by a summary of some studies in the relationship between the incidence of poliomyelitis and weather. The author analyzes the relationship between weather and climate and endemic poliomyelitis (Heine-Medin disease) in Hungary on the basis of a 17 year record. Statistical data are presented on the monthly incidence of polio for each year of the period 1931–1947; the annual incidence by city and department in each year of the given period and the weather characteristics of the months with the highest incidence of polio (deviation of the monthly mean temperature from the 30 year mean days with maximum temperature $\geq 30°C$, and character of the month, whether rainy, dry, etc.). The author found that the epidemic shows a distinct seasonal character since it manifests itself either during the late summer or early fall. The epidemics

n Hungary show no relation to fronts or surfaces of subsidence. Most cases of polio occurred when ry months were a little more frequent. There is some indication of a double wave during a sunspot eriod. The disease was found to be most frequent in the northern and northeastern regions of Hungary which are relatively cooler and richer in precipitation. (*Same item as* 2.2–150, Feb. 1951, *1.A.B.*) *Subject Headings:* **1. Weather effects on poliomyelitis 2. Poliomyelitis.**—*I.L.D.*

8K–99 551.586:612

Reuter, Heinz, **Zur Berechnung kurzfristiger Änderungen der menschlichen Hauttemperatur.** The calculation of short-period changes of human skin temperature.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 4(2):213–222, **1952.** 2 figs., 7 refs., 33 eqs. German, English nd French summaries p. 213–214. **DWB**—Using the equations for heat conduction (unidimenional equation) and radiation, the author derives a differential equation for calculating short period hanges of skin temperature in the open with a known coefficient of absorption ν. The solution of his equation, taking into account the effect of evaporation, is presented. A simplified form is:

$$\vartheta - \vartheta_a = \frac{i}{f} - \frac{i(\nu + h)}{f\nu h a \sqrt{\pi}} t^{-\frac{1}{2}}$$

where i is incoming radiation, t = time. Constants from measurements by H. M. Bolz are:

$$f = 0.112,\ a^2 = 10^{-3}\ \text{cm}^2/\text{sec.},\ h = f/k\ (k = \text{heat conductivity}).$$

(*Same item as* 4.4–256, April 1953, *M.A.B.*) *Subject Heading:* **1. Skin temperatures.**—*C.E.P.B. & I.L.D.*

8K–100 551.586:611

Riesser, Otto; Kunze, Gerhard and Galle, Käte, **Fortgesetzte Untersuchungen zur Frage ler Beziehungen zwischen Muskelstoffwechsel und Witterung.** [Continued investigatons on he relationship between muscle metabolism and weather.] *Biochemische Zeitschrift*, 277:349–364, **1935.** 10 figs., tables, ref. **DNLM**—The daily determination of the socalled directly determinable phosphoric acid (the sum of phosphagen and inorganic P_2O_5) and glycogen in the muscles of 50 rabbits shows that in respect to order of magnitude and variations, no difference exists between rabbits at an elevation of 3500 m above sea level and those at sea level. The daily phosphoric acid nd glycogen values of animals under similar experimental conditions are very much alike and the naximum and minimum curves, except for large deviations, are generally parallel. The majority of the deviations are attributed to the occurrence of inversions. Animals kept in the open air showed lower P_2O_5 and higher glycogen values than those kept in the sun. This is attributed to a nore intense cooling. In general the variation of most curves is quite independent of the external conditions under which the animals were maintained and therefore is the result of a meteorological process. The experiments carried out at sea level (Breslau) showed a different curve both for P_2O_5 and glycogen. The greater deviations of the parallel course of the maximum and minimum n contrast to those at higher elevation are attributed to the greater seasonal frequency of unstable weather processes. *Subject Heading:* **1. Weather effects on muscle metabolism.**—*Based on authors' summary.*

8K–101 551.586:616

Sandritter and Becker, F., **Beitrag zur Frage der Wetterabhängigkeit der Lungenembolie.** [Contribution to the problem of the dependence of pulmonary embolism upon weather.] *Deutsche Medizinische Wochenschrift*, Stuttgart, 76(48):1526–1528, **1951.** 3 tables, ref. **DNLM**—Over a period of three years 130 cases of fulminating and nonfatal pulmonary embolism were autopsied at the Senkenberg Pathological Institute (Frankfurt a.M.). Those cases for which the date and exact hour of occurrence of embolism could be ascertained were analyzed statistically with respect to conventionally prevailing weather processes, such as stable or unstable upglide, cold or warm front, occlusions, etc. In the case of unstable upglide processes, warm and cold fronts the incidence of pulmonary embolism is greater than chance. It is also shown that well nourished and corpulent individuals are especially meteorotropic. *Subject Heading:* **1. Weather effects on pulmonary embolism.**—*I.L.D.*

8K–102 551.586:616:551.521.63

†Sargent, Frederick, II and Sargent, Virginia W., **Medical progress: season, nutrition and pellagra.** *New England Journal of Medicine*, 242:447–453, 507–514, March 23 and March 30, **1950.** 5 figs., 4 tables, 84 refs. **DLC**—On the basis of data on monthly intake of food and monthly incidence of pellagra collected by Goldberger and data on the nutritional value of the food consumption of the population studied by Goldberger, the author concludes that the seasonal wave of pellagra is determined by seasonal variation in the metabolism of man (a theory postulated by Edmund Hughes in **Seasonal variations in man**). The external stimulus to the seasonal variation in metabolism is

assumed to be the ultraviolet portion of the spectrum. (*Same item as* 5.4–233, April 1954, *MAB.*) *Subject Headings:* **1. Ultraviolet radiation effects on pellagra 2. Pellagra.**—*I.L.D.*

8K–103 551.586:612.39

†Sargent, Frederick, II (*Univ. of Ill.*), **Season and the metabolism of fat and carbohydrate a study of vestigial physiology.** *Meteorological Monographs*, Boston, 2(8):68–80, Oct. **1954.** 5 figs. 5 tables, 90 refs. **DWB**—The author presents a critical review of the literature on the seasona variation in the metabolism of fat and carbohydrates with special reference to the theory o E. Hughes that seasonal variations in physiological processes and metabolic diseases are attributabl to a vestigial physiological mechanism that is similar to hibernation in lower animals. The physio logical evidence for this hypothesis includes the seasonal growth of children, the seasonal variatior in the intake of carbohydrates and fat, seasonal variations in the metabolism of fats, ketones, ir glycogen formation and storage, and the seasonal exacerbation of the symptoms of diabetes mellitus The evidence presented for the hypothesis of vestigial physiological mechanism is contradictory an inconclusive. (*Same item as* 6.10–263, Oct. 1955, *MAB.*) *Subject Headings:* **1. Seasonal variation in metabolism 2. Metabolism.**—*I.L.D.*

8K–104 551.586:612.1

Sarre, Hans and Steinbach, Günther, **Kardiale Ödema und Jahreszeit.** [Cardiac edema an season.] *Klinische Wochenschrift*, No. 25:810–812, **1947.** 4 figs., ref. **DNLM**—In 922 cases o ambulant cases of heart and kidney disease which were treated during 1943–1945 there occurre 201 cases of edema. Every year the percentage of edema cases was a minimum during the winte with a gradual rise to a peak in Aug. and a decline towards the colder months. During the warn months the frequency of edema cases was almost double that in the winter months. A straight lin relationship between the frequency of edema and the mean monthly temperature is established this relationship is statistically significant. The cause of the increased frequency of edema durin the summer is attributed to dilation of the capillaries and increased permeability. *Subject Heading* **1. Temperature effects on cardiac edema.**—*Authors' summary & I.L.D.*

8K–105 551.586:61

Sarre, H. and Betz, L., **Klimatische Einflüsse auf den Blutdruck des Hypertonikers.** [Climati influences on the blood-pressure of hypertensives.] *Annalen der Meteorologie, Medizin-meteoro logische Hefte*, No. 4:26–29, **1950.** 2 figs., 2 tables. **DWB, DLC**—The relationship between chang in blood pressure and changes in atmospheric pressure during days with passages of cold and warn fronts was investigated during Dec.–March 1946 1947 in Frankfurt a.M. The subjects were 8 patients suffering from esseurial and renal hypertension. The controls were patients with othe circulatory diseases. Over 9000 blood pressure measurements were taken. The relationshi between barometric pressure change and blood pressure change was analyzed statistically with th aid of the Schilling P-value and 2×2 tables. For changes in blood pressure a close correlation wa obtained with all barometric changes ($T = 27.53$ in case of a T greater than 3 as significance value) for blood pressure changes of 10 mm Hg and greater $T = 21.78$ for a smaller number of cases. Sixty two percent of the cases vary in the same sense as the barometric pressure—a number statisticall significant in view of the large number of measurements. The correspondence between bloo pressure change and barometric pressure change is even more marked if cold front and warm fron days are considered. Among patients whose blood pressure reacted in the same as the barometri pressure, this reaction occurred in 96% of the days; a similarly high percentage occurred in the cas of cold front and warm front days; not recorded in the case of the former. (*Same item as* 2.8–154 Aug. 1951, *MAB.*) *Subject Heading:* **1. Atmospheric pressure effects on blood pressure.**—*I.L.D.*

8K–106 551.521.64:551.594.12:61

†Schaefer, Hermann J. (*Naval Air Station, Pensacola, Fla.*), **The biologic effects of cosmi radiation.** (In: U. S. School of Aviation Medicine, Randolph Field, Texas, **Physics and medicin of the upper atmosphere.** Albuquerque, **1952.** p. 290 315. 7 figs., 3 tables, 26 refs.) **DLC**– An extensive review of the ionization characteristics of heavy nuclei and that of ordinary types ionizing particles with particular reference to the spatial distribution of the primary ionization in th microscopic structure of biological tissues, radiation effects upon germ and somatic cells, a considera tion of the effects produced by comparative ionization dosages from internal radium and from primar cosmic radiation, and of the properties and biological effects of disintegration stars and air shower Photographs and diagrams and an extensive bibliography are included. (*Same item as* 4H–16 Aug. 1953, *MAB.*) *Subject Heading:* **1. Biological effects of cosmic radiation.**—*I.L.D.*

8K–107 551.594:551.58

Schilling, Gerhard F. and Holzer, Robert E., **Über mögliche Zusammenhänge zwischen Bio klimatologie und Luftelektrizität.** [Possible relationships between bioclimatology and atmospher

electricity.] *Wetter und Leben*, 6(1/2):13–16, March **1954.** 9 refs. **DWB**—Specific physiological reactions to nonthermal weather changes occur when the subjects are both in the open air and in closed spaces and the physiological responses are manifested before the actual weather changes. The possibility is suggested that electromagnetic waves from storm centers might account for these phenomena and evidence is presented that indicates that the variations in the electrical conductivity of the atmosphere are parallel indoors and outdoors and show variations a number of hours before the appearance of a meteorological front so that changes in atmospheric electricity are the mediating element between weather change and physiological response. The relationship between cosmic radiation, local radiation and nuclei content of the atmosphere, atmospheric ion concentration and physiological reaction are discussed. (*Same item as* 6.5–334, May 1955, *MAB.*) *Subject Headings:* **1. Atmospheric electricity 2. Physiological climatology.**—*I.L.D.*

8K–108 551.515.8:617.7

Schorn, Julius, **Glaukomanfall und Wetter.** [Glaucoma and weather.] *Graefes Archiv für Opthalmologie*, 48(1/2):121–128, **1948.** 4 figs., 1 table, ref. **DNLM**—The literature on the relationship between glaucoma and weather is reviewed briefly. The author studied the relationship between weather and glaucoma in 91 cases over the period 1932–1942. Forty-one of the cases occurred between April and Sept. and 50 during the months Oct. and March. The various weather elements occurring on the day of the glaucoma attack and immediately before and after the attack were analyzed. Barometric pressure and precipitation were irrelevant. Of particular significance was air mass movement on the passage of fronts. It was found that 78% of all cases occurred on days with frontal passages. *Subject Heading:* **1. Frontal effects on glaucoma.**—*I.L.D.*

8K–109 551.586:313.1

Schröder, Bertold, **Unfälle und Wetter.** [Accidents and weather.] *Annalen der Meteorologie, Medizin-Meteorologische Hefte*, Hamburg, No. 11:133–136, **1956.** Also: Köhn, Werner, **Hamburger Verkehrsunfälle und Wetter.** [Hamburg traffic accidents and weather.] *Ibid.*, p. 137–147. 16 figs., 15 refs. Also: Cyran, W., **Betriebsunfälle und Wetter (Eigenreferat).** [Industrial accidents and weather (summary).] *Ibid.*, p. 148. Also: Daubert, Karl, **Betriebsunfälle des Bundesbahn in Württemberg und Wettergeschehen.** [Accidents on the Wurttemberg Federal railroad and weather.] *Ibid.*, p. 149–151. 3 figs., 2 refs. Also: Spann, W., **Diskussions-Beitrag zu "Verkehrsunfälle und Wetter."** [Discussion of "Traffic accidents and weather."] *Ibid.*, p. 152. 2 figs., refs. **DWB**—Schröder opened the discussion by describing statistical investigations in Germany which pose the question whether there is a connection between human proneness to accident and some factor such as infra-long-wave radiation. If so, can accident forecasts be issued, how and when, and what effect will they have? Köhn discussed the incidence of street accidents in Hamburg. These are mostly due to traffic congestion but accidents were most frequent on days with a rapid change of weather, such as a change from anticyclonic to cyclonic, especially with strong cyclogenesis. Examples are given with synoptic charts. Statistics for 1952–1954 show that this relation is statistically highly significant. Cyran stated that industrial accidents were not significantly related to disturbed (cyclogenetic) days. (*Same item as* 7.11–86, Nov. 1956, *MAB.*) *Subject Headings:* **1. Weather effects on accidents 2. Traffic accidents 3. Industrial accidents.**—*C.E.P.B.*

8K–110 551.586:612

Slonim, A. D., **Signal'nye faktory vneshneĭ sredy i ikh znachenie dlia meditsinskoĭ klimatologii.** [Signal factors of environment and their significance in medical climatology.] *Gigiena i Sanitariia*, Moscow, No. 7:3–11, **1953.** **DLC**—The author examines the possibility of applying the principles of the conditioned reflex to analysis of the action of the meteorological variables upon physiological processes and reviews various studies involving the application of this approach. These include the nervous response to air movement apart from its cooling effect (I. A. Oponin), the effect of change in working position upon heat regulation in man (A. S. Ponugaev and O. I. Margolin), effect of radiant heat loss upon respiratory exchange and skin temperature, action of light upon metabolism and its relation to physiological rhythm, adaptation to cold by training and hardening, etc. (*Same item as* 5.8–253, Aug. 1954, *MAB.*) *Subject Headings:* **1. Physiological climatology 2. Conditioned reflex method.**—*I.L.D.*

8K–111 551.586:612

Spangenberg, Wolf W., **Atmung bei Schwüle.** [Breathing in sultriness.] *Angewandte Meteorologie*, 1(1):24–28, **1951.** 4 figs., 7 refs. **DLC**—Systematic measurements of maximum breathing depth (vital capacity) made on 30 experimental subjects on days with marked sultriness gave the following results: in 67% of the subjects, the vital capacity decreased on the average by 12.5%, in 30% it increased by 10.5% and in 3% it showed no changes. Unequivocal influences of sex and age upon breathing during sultriness could not be established. Vital capacity was more greatly influenced by intense than by moderate sultriness. The relationship between vital capacity and

sultriness in asthmatic patients is not clear cut. (*Same item as* 2.10–174, Oct. 1951, *MAB.*) *Subject Heading:* **1. Sultriness effect on breathing.**—*I.L.D.*

8K–112 551.586:612.2

Spangenberg, W. W., **Geruchsempfindungen in Abhängigkeit von atmosphärischen Vorgängen.** [Dependence of olfactory sensations upon atmospheric processes.] *Angewandte Meteorologie*, 1(6):170–172, June **1952.** 16 refs. **DWB**—The author discusses the phenomenon that particular atmospheric conditions are associated with characteristic olfactory sensations: 1) variable stimulus intensity but constant sensitivity (increase in concentration of stimulus or variable weather processes), 2) variability of sensation with constant stimulus (change in sensation threshold caused by atmospheric phases) and 3) variability of both factors simultaneously. The literature dealing with this phenomenon is summarized and its association with various pathologic states influenced by weather, namely rheumatic and post pleuritic pain and asthma, is mentioned. The production of such olfactory sensations is due to: 1) composition of respired air, 2) non-specific stimuli and 3) false olfactory sensations (nervous and mental states). (*Same item as* 5.5–218, May 1954, *MAB.*) *Subject Headings:* **1. Weather effects on olfactory sensations 2. Olfactory sensations.**—*I.L.D.*

8K–113 551.586:616.925

Spann, W. and Ungeheuer, H., **Zur Frage der Wetterabhängigkeit der Poliomyelitie.** [The problem of the dependence of poliomyelitis on weather.] *Zeitschrift für Klinische Medizin*, 154(1):1–22, **1956.** 8 illus., 5 tables. **DNLM**—1012 cases of poliomyelitis which occurred in Munich and Upper Bavaria during the 5 year interval 1950–1954 were investigated statistically in relation to air temperature and humidity. From the sixth to the third day preceding incidences of start of poliomyelitis there was found a statistically significant rise in the mean daily temperature above the normal with greatest warming on the third day. For the period 6–20 preceding days no peculiarities in the air temperature behavior was observed. In the case of the relationships of poliomyelitis to warm-humid day there was a statistically significant relationship to the increase of polio cases; this relationship is most marked on the second and third preceding day. Examinations of the beginning of polio with reference to cold-day days showed statistically significant relationship. The cases of polio occurring in seasons with few cases show the same relationship to the temperature-humidity environment. *Subject Headings:* **1. Temperature effects on poliomyelitis 2. Humidity effects on poliomyelitis 3. Poliomyelitis.**—*I.L.D.*

8K–114 551.586:616–002.73

Stein, A. A., **Lepra reaction and meteorotropisms,** *International Journal of Leprosy*, 3(2):132–152, **1935.** 11 figs., ref., 2 tables, ref. **DNLM**—The author studied the relationship between leprous processes on 88 cases of leprosy at the Leprosarium in Leningrad. No relation was found between exacerbation and annual or monthly temperature, barometric pressure, rainfall and wind. The greatest number of exacerbations (73%) occurred during the passage of cyclones and occluded cyclones. In the cold seasons exacerbations occur when a warm front sets in and in the warm season when a cold front sets in. In stable weather only a small number of exacerbations are observed (7%). The exacerbation of leprous processes occurs not only on the days the variable atmospheric layer passes but also on the previous day. *Subject Heading:* **1. Weather effects on leprosy.**—*I.L.D.*

8K–115 551.555.3:616.12

Stival, L. and Zanchi, M., **La mortalità per infarto miocardico in rapporto al clima nella città di Milano: indagine anatomo-patologica.** [Mortality from myocardial infarction in relation to climate in Milan: an anatomical-pathological investigation.] *Folia Cardiologica*, Milan, 14(6):581–586, Dec. 31, **1955. DNLM**—The mortality from myocardial infarction in Milan during the period of 1936–1954 is investigated on the basis of 155 cases in which death occurred from a recent infarct. The mean monthly incidence of deaths shows a maximum during cold humid months Jan.–March and Oct.–Dec. The highest incidence of deaths during March and Nov. is associated with föhn weather in the Po valley. *Subject Heading:* **1. Föhn effects on cardiac infarction.**—*I.L.D.*

8K–116 551.555.3:551.594.1

Storm van Leeuwen, W., Booij, J. and van Niekerk, J., **Luftelektrizität und Föhnkrankheit** [Atmospheric electricity and föhn sickness.] *Beiträge zur Geophysik*, 38(3/4):407–425, **1933** 4 figs., 4 tables, 14 refs. **DLC** (QC801 B3)—The author investigates experimentally the possibility that föhn disease symptoms are produced by atmospheric electricity changes that occur during the preföhn and föhn periods. During several föhn periods measurements were made of the number of large and small ions in the atmosphere and of its conductivity during normal preföhn conditions accurate determinations were made of the occurrence of symptoms during the preföhn period; also indoor air was completely freed from ions, and manifestation of föhn symptoms within a room with ion-free air was observed. No relationship could be established between föhn disease and the

atmosphere's electricity. (*Same item as* 2G–168, July 1951, *MAB.*) *Subject Heading:* **1. Föhn sickness.**—*I.L.D.*

8K–117 551.555.3:551.586

Storm van Leeuwen, W. and Booij, J., **Studien über die physiologische Wirkung des Föhns. Luftdruckschwankungen und Föhn.** [Studies on the physiological effect of föhn: air pressure oscillations and föhn.] *Beiträge zur Geophysik*, 39(1):105–117, **1933.** 10 figs., 4 refs. **DLC**—The literature dealing with the evidence that small oscillations in atmospheric pressure are the cause of föhn disease symptoms is reviewed. In order to test this hypothesis, atmospheric pressure variations recorded during the preföhn and föhn periods in a closed room showed oscillations of pressure with an amplitude of 6–7 mm and a frequency of 4–5 in 10 sec. These oscillations were produced by wind gusts. With experimental subjects, it is shown that pressure oscillation did not check föhn symptoms; oscillation of 10–20 mm (water) and a frequency of one minute produced unpleasant symptoms which were different from those attributed to föhn. (*Same item as* 2G–169, July 1951, *MAB.*) *Subject Heading:* **1. Föhn sickness.**—*I.L.D.*

8K–118 551.555.3:612

Storm van Leeuwen, W.; Booij, J.; Israël, Hans and van Niekerk, J., **Studien über die physiologische Wirkung des Föhns. Luftdruckschwankungen, Luftzusammensetzung und Föhn.** [Studies of the physiological effect of föhn. Pressure oscillations, air composition and föhn.] *Beiträge zur Geophysik*, 44(4):400–439, **1935.** 29 figs., 4 tables, 16 refs. German, English and French summaries p. 400–402. **DLC**—An extensive series of experiments have been carried out in order to determine when föhn disease could be attributed to changes in atmospheric electricity, to oscillations in atmospheric pressure or the appearance of foreign gases in the atmosphere during föhn. The procedures employed in making these studies, including descriptions of the apparatus used with diagrams and photographs, and the results obtained are presented. The disease symptoms associated with föhn symptoms in Innsbruck were not related causally to atmospheric electricity phenomena. No relationship could be established between föhn disease and atmospheric oscillations of pressure having a period longer than 1 sec. The periods from 1 sec. to the limit of audibility do not produce föhn disease symptoms. Finally, the possibility that such gases as nitrous oxide, nitrous acid, nitric acid or their salts appear in the atmosphere during föhn is not confirmed. (*Same item as* 2G–190, July 1951, *MAB.*) *Subject Heading:* **1. Föhn sickness.**—*I.L.D.*

8K–119 551.586:612

Straube, G., **Die Erfassung vegetativnervöser Reaktionsänderung unter den Einfluss von Wettervorgängen.** [The determination of changes in the reaction of the autonomic nervous system under the influence of weather processes.] *Archiv für Physikalische Therapie*, 3(24–30):**1951.** figs., ref. **DNLM**—Acetylcholine and adrenaline electrophoresis is used to determine the state of the autonomic nervous system. Skin reactions to acetylcholine and adrenaline electrophoresis were determined over a period of six months on 12–15 individuals. The tests were made either several times per day or on successive days. The intensity of the skin reactions was analyzed with reference to associated weather conditions, such as fronts, occlusions, air masses, up- and down-slide phenomena, inversions, etc. The acetylcholine electrophoresis show a marked skin reaction during cold and warm fronts, occlusions and air mass boundaries, before and during up and down slides and during free föhn, during inversions when the inversion boundary is above the point of observation. Similarly adrenaline electrophoresis produces intensified skin reactions under the same weather conditions as compared with normal weather. Hence, under these weather conditions the vagus and the sympathicus are subjected to similar stimuli. *Subject Heading:* **1. Weather effects on skin reactions.**—*I.L.D.*

8K–120 551.586:616.12

Struder, M.; Becker, F. and Haas, G., **Über die Abhängigkeit des Herzinfarkteintrittes vom Wettergeschehen, Tagesrhythmus und von solaren Wirkungen.** [The dependence of cardiac infarct upon weather phenomena, daily rhythm and solar effects.] *Klinische Wochenschrift*, 29(17/18):312–315, **1951.** 4 figs., 1 table, ref. **DNLM**—The relationship between cardiac infarction with weather disturbances, solar phenomena and the diurnal and annual rhythm was investigated in 63 cases. It was found that 87.3% coincided with weather disturbances such as cold and warm fronts, occlusions, etc. It is shown statistically that this association between weather processes and cardiac infarctions is greater than chance. The cardiac infarcts occurred during the first four hours of the weather disturbance. No relationship could be established between cardiac infarction and terrestrial magnetic phenomena. A seasonal influence was observed since the lowest number of infarctions occurred during May, June and July. A daily rhythm is indicated in that the hours from 0800 to 1400 o'clock have the highest number of infarctions and 1400–2000 the lowest. A second peak occurs during the period 2000–0400 o'clock. *Subject Heading:* **1. Weather effects on cardiac infarction.**—*I.L.D.*

8K–121 551.586:616

Stumpfegger, L. and Eydaw, W., **Postoperative Lungenembolie und Wetter.** [Postoperative pulmonary embolism and weather.] *Zenttralblatt für Chirurgie*, 67(37):1723–1729, **1940.** 13 figs. **DNLM**—The literature on influence of weather upon the clinical picture of embolism is reviewed. Simultaneously with the observations on the cause of the disease in 44 patients, weather observations were made at the private weather station of the Höhenlych hospital. Observations were made on temperature, humidity, precipitation, radiation, wind and barometric pressure. Twenty cases of embolism occurred during frontal passages but an equal number occurred when no fronts were observed and when a stationary high pressure system was present. A relationship was observed between extreme diurnal anomalies of atmospheric vapor pressure and the occurrence of embolism. *Subject Headings:* **1. Weather effects on pulmonary embolism 2. Pulmonary embolism.**—*I.L.D.*

8K–122 551.586(439.1):612.275

Takácsy, László, **Tapasztalatok a frontátvonulások hatásárol, 3 évi boncolási anyag alapján.** [The effect of frontal passages as shown by autopsies over a period of three years.] *Időjárás*, 55(7/8):199–209, July/Aug. **1951.** table, graph, 14 refs. French and Russian summaries p. 247. **DLC**—Sudden death in 1847 cases, which occurred during the period 1948–1950, is investigated by means of an arrangement in time series in conjunction with 10,756 frontal passages. The statistical method used in testing the significance of the correlation is explained in detail. A definite correlation is found between the passage of fronts and the number of sudden deaths. There is also a pre-frontal and a post-frontal effect, the latter being more marked than the former. Cold and warm fronts are found to be equally effective. Hungarian, German and Russian literature on meteoropathology is reviewed. (*Same item as* 5.2–280, Feb. 1954, *MAB.*) *Subject Headings:* **1. Frontal passage effects on sudden death 2. Medical meteorology 3. Weather sensitivity.**—*G.T.*

8K–123 551,586:612.2

†Takácsy, László, **Újabb vizsgálatok a hirtelen szívhalál meteorológiai vonatkozásairól 1000 boncolás kapcsán.** [Investigation of the meteorological aspects of sudden heart failure based on 1000 autopsies.] *Időjárás*, Budapest, 57(5):272–287, Sept./Oct. **1953.** 10 figs., 4 tables, 40 refs. **DLC**—The effect of frontal passages on the time of death is investigated on the basis of 1000 autopsies. The pathological structural changes which caused the deaths are described. The investigation reveals accumulations of mortality grouped around frontal passages. Statistical analyses indicate that these accumulations are due to a biological effectiveness of fronts rather than to chance. (*Same item as* 5.10–211, Oct. 1954, *MAB.*) *Subject Heading:* **1. Frontal effects on mortality.**—*Trans. of author's abstract.*

8K–124 551.586:612.275

Takáts, István and Szénásy, József, **Két súlyos kórkép frontátvonulásokkal való kapcsolata.** [Connection of two serious syndromes with frontal passages.] *Idjőárás*, 56(7/8):234–236, July/Aug. **1952.** 4 refs. **DLC**—The author recorded 187 cases of pregnancy eclampsia (1948–1950) and 95 cases of fatal dehydration and investigated their correlation with frontal passages. He gives a summary of his findings. In 62% of the cases recorded, eclampsia was found to occur during "biologically active periods" of frontal passages. When several cases accumulated within a short range of time, this usually occurred in conjunction with frontal passages. No significant correlation is found between death from dehydration and frontal passages. (*Same item as* 5.5–219, May 1954, *MAB.*) *Subject Heading:* **1. Frontal effects on eclampsia.**—*G.T.*

8K–125 551.515.8

†Tholuck, Hans Joachiem, **Selbstmord und Wetter.** [Suicide and weather.] *Beiträge zur Gerichtlichen Medizin*, 16:121–151, **1942.** 18 tables, 23 illus., 120 ref. **DNLM**—The literature on the relationship between weather and suicide is reviewed extensively. The author investigated the relation between weather and suicide in all cases of suicide that were autopsied at the Frankfurt a.M. Institute für Gerichtliche Medizin und Kriminalistik during 1939. Two hundred cases of suicide in which the time of self destruction could be definitely ascertained were investigated in relation to concomitant daily atmospheric pressure and temperature, relative humidity, precipitation, front, air mass and lunar phase. Using the n-method, the author found that a relationship exists between suicide and frontal passages (somewhat greater with warm than with cold fronts). A very extensive bibliography on weather and the psyche is appended. *Subject Headings:* **1. Frontal effects on suicide 2. n-method.**—*I.L.D.*

8K–126 551.586:612(47

Tribukh, S. L., **O roli nekotorykh faktorov v rasprostranenii grippoznykh zabolevanii na shveĭnykh fabrikakh.** [The influence of different factors on the distribution of grippe cases in sewing factories.] *Gigiena i Sanitaria*, No. 2:20–26, **1952.** 4 tables. **DLC**—The relationship between the

requency of occurrence of grippe and meteorological factors was investigated in four sewing shops ver the period 1949/1950. The seasonal nature of the disease is indicated by the fact that maximum ncidence occurs during a period of 1½ months during Feb.–March. It was found that a negative orrelation exists between grippe incidence and temperature and a positive one between grippe ncidence and relative humidity. Data are presented also on the frequency of attacks of grippe in ne same individual. The microclimate of the working rooms, including air movement, temperature, tc. and bacterial count of the air, is investigated. (*Same item as* 4.5-211, May 1953, *MAB.*) *ubject Headings:* **1. Weather effects on influenza 2. Influenza 3. Workroom microclimate.** *–I.L.D.*

8K–127 551.521.64:576.8

Tzschaschel, R. and Bergter, F., **Untersuchungen zur Wirksamkeit der kosmischen Ultrastrahlung (KS) auf Mikroorganismen.** [Investigations of the effectiveness of cosmic radiation on nicroorganisms.] *Naturwissenschaften*, 42(24):649, Dec. **1955.** fig., 2 refs. **DWB**—The effect f soft cosmic rays upon the growth of microorganisms was investigated by examining the growth of wo strains of bacteria, *Bacillus subtilis* and *Bacillus mycoides*, and the fungus *Mucos recemosus* nder various lead thicknesses which ranged from 0 to 4.5 cm. Analyses by days, locations and ead thicknesses were carried out. The mean value of the microorganisms below the lead shields ould be represented by a Rossi curve. Half of the days of the curve maximum are found below .5 cm Pb. The differences in effect of the various thicknesses for various levels of significance are nalyzed. (*Same item as* 7D–185, April 1956, *MAB.*) *Subject Headings:* **1. Biological effects of osmic radiation 2. Cosmic ray effects on microorganisms.**—*I.L.D.*

8K–128 551.586:313:629

Undt, W. (*Vienna*), **Wetter und Verkehrsunfälle.** [Weather and transportation accidents, 't. 1.] *Wetter und Leben*, Vienna, 8(1/2):28–33, **1956.** 2 refs. **DLC.** Also, **Pt. 2, Schwüle-ropen- und Gewittertage und Verkehrsunfälle.** [Pt. 2, Sultry, tropical and thunderstorm days nd transportation accidents.] *Ibid.*, 8(5/7):113–115, **1956.** 3 refs. **DLC**—This analysis of the elationship between weather and traffic accidents indicates that the greatest number of accidents ccurred on days with marked bad weather (rain, snow, frontal passages, fog, etc.). The lowest umber of accidents occurred on rain free days or days with slight rainfall. Data are presented on he annual and weekly variation of traffic accidents in Vienna and the days with maximum and inimum number of accidents. In Pt. 2, an attempt is made to determine whether days which are egarded as uncomfortable subjectively owing to difficulty in maintaining heat balance on days ith high temperatures, high humidity and also storm days, are characterized by a disproportionately igh frequency of transportation accidents. Sultriness was defined as days with a vapor pressure ≥ 14.1 mmHg and tropical days are those with a temperature $\geq 30°C$. A statistical analysis of me 60,170 traffic accidents over a period of 1314 days indicates that the number of accidents is gnificantly greater on uncomfortable days than on comfortable days. *Subject Headings:* **1. Weather ffects on traffic accidents 2. Traffic accidents.**—*I.L.D.*

8K–129 551.586:612.2

†Ungeheuer, Hans, **Ein meteorologischer Beitrag zu Grundproblemen der Medizin-Meteorologie.** Meteorological contribution to the fundamentals of medical meteorology.] *Germany. Deutscher Vetterdienst, Berichte*, 3(16), **1955.** 32 p. 23 figs., 7 tables, 42 refs. **DLC**—After reviewing briefly he fundamental problem of medical-meteorological weather analysis, the author presents the Tölz echnique of medical meteorological analysis. It is based upon the presupposition that a relationhip exists between mean rhythmical weather processes produced by the diurnal and annual variations f the meteorological elements and the annual and daily variation of biological processes so that periodic weather disturbances produce aperiodic vital disturbances. Local weather is classified nto six weather phases; their interrelationship is analyzed in particular with reference to the temerature-humidity environment. The relationship between the individual weather phases and arious biological phenomena is examined with reference to milk and fat production of cows, throat, ose and ear diseases, stomach operations, intraocular pressure, general well being, scholastic perormance, sensitivity to pressure pain, protein reaction in blood serum, capillary resistance, blood ressure, industrial accidents, etc. (*Same item as* 7.3–271, March 1956, *MAB.*) *Subject Heading:* **. Weather sensitivity.**—*I.L.D.*

8K–130 551.586:612.014.4

Vetoshkin, S. I., **Okhlazhdenie organizma cheloveka v zavisimosti ot vertikal'nykh perepadov ozdushnoĭ sredy v zhilishche.** [The chilling of the human organism as a function of the vertical npse of air temperature in dwellings.] *Gigiena i Sanitaria*, Moscow, No. 8:17–22, Aug. **1952.** figs., table. **DLC**—Lightly clothed individuals performing mental work were subjected to room onditions in which the horizontal temperature gradient was slight but the vertical temperature

gradient between the floor to a height of 1.5 meters varied, and the skin temperature, flow of nasal mucosa and temperature of the skin and of the spine and subjective feelings of comfort and discomfort were recorded. The resulting measurements fell into two groups according to whether the vertical temperature between the floor and 1.5 m was greater or less than 4°C. The fitst group was characterized by a fall of 7.0–10.2°C in temperature of the skin of the toes and by discomfort; the second group was marked by a slight change in toe temperature over a period of 3–4 hours and by comfort. (*Same item as* 5.8–254, Aug. 1954, *MAB.*) *Subject Headings:* **1. Chilling 2. Physiological climatology.**—*I.L.D.*

8K–131 551.586:615.8

*Vogt, Heinrich Wilhelm and Amelung, Walter, **Einführung in die Balneologie und medizinische Klimatologie. Bäder- und Klimaheilkunde.** [Introduction to balneology and medical climatology. Balneotherapy and climatic therapy.] 2nd ed. Berlin, Springer, **1952.** 266 p. 40 tables, 29 figs., bibliog. p. 258–262. **DLC**—The section on climatology contains: 1) a descriptive account of the physics and chemistry of the atmosphere, the properties of the individual meteorological variables of air masses, aerosols, atmospheric electricity, weather processes and climatic types; 2) the physiological effects of the individual meteorological variables, heat balance of the human organism, heat and cold injuries, chilling, pathological effects of weather influences, influence of chemical constituents of the atmosphere, diurnal and seasonal periodicity of disease; influence of climate upon the spread of diseases, therapeutic effect of climate upon physiological processes, physiological effect of climate and artificial climates and 3) utilization of high and moderate altitude climates and marine climates for curative purposes in various chronic diseases. (*Same item as* 4.10–246, Oct. 1953, *MAB.*) *Subject Headings:* **1. Medical climatology 2. Balneology 3. Climatotherapy.**—*I.L.D.*

8K–132 551.586:616.8

von Ekesparre, W., **Kapillarresistenzmessungen bei commotio cerebri im Vergleich zum Wettergeschehen.** [Measurements of capillary resistance in case of concussion in relation to weather.] *Annalen der Meteorologie, Medizin-Meteorologische Hefte,* Hamburg, No. 11:83–85, **1956.** 2 figs., 12 refs. **DWB**—Stimulation of the sympathetic nervous system increases capillary resistance while stimulation of the parasympathic nervous system lowers it. Using KÜCHMEISTER'S method for measuring capillary resistance, the author investigated the influence of weather conditions upon the capillary resistance of normal individuals and in patients with concussion of the brain. In the former, no unequivocal weather influence could be established. In the case of the latter (361 measurements on 28 patients) it was found that on days with cyclogenetic weather in the morning the capillary resistance was high; on days with anticyclonic weather high values were much more infrequent. (*Same item as* 7.11–99, Nov. 1956, *MAB.*) *Subject Heading:* **1. Atmospheric pressure effects on capillary resistance.**—*I.L.D.*

8K–133 551.586:616.988.23

Wada, H. (*Aomori Weather Station*), **Infantile paralysis and atmospheric phenomena.** *Geophysical Magazine,* Tokyo, 23(1):55–58, Dec. **1951.** 2 figs., 3 tables. **DWB**—The occurrence of infantile paralysis in Japan in relation to daily variations of meteorological elements is analyzed. Cases of infantile paralysis were found most frequent during the passage of front at a level of significance of 5%. Also, the month with the highest relative humidity also had the highest incidence of poliomyelitis. There is a very high correlation between incidence of polio and months with high relative humidity of 1% level of significance. Analysis is based on data for five years. Temperature charts for the U. S. are discussed. (*Same item as* 4.8–248, Aug. 1953, *MAB.*) *Subject Headings.* **1. Weather effects on poliomyelitis 2. Poliomyelitis.**—*I.L.D.*

8K–134 551.571:551.586:616.2

Waddy, B. B., **Climate and respiratory infections.** *Lancet,* 263:674–677, Oct. **4, 1952.** 2 figs. 5 tables. See also p. 668–669. **DLC**—In the Gold Coast and other parts of tropical Africa respiratory infections, cerebrospinal meningitis and lobar pneumonia occur in epidemic form during the dry season and in arid regions. Examination of the incidence of cases with the seasonal variation of temperature, absolute humidity and relative humidity indicates that absolute humidity (less than 9 gm/m^3) is associated with the occurrence of the diseases. The correlation between number of cases of cerebrospinal meningitis and absolute humidity of the previous 4 weeks is −0.53. In England and Wales respiratory infections are highest in late winter and spring, and also incidence of cerebrospinal meningitis is highest in winter and spring. Here also cold dry weather favor the spread of these infections. (*Same item as* 4.9–153, Sept. 1954, *MAB.*) *Subject Headings:* **1. Humidity effects on respiratory infections 2. Respiratory infections.**—*I.L.D.*

8K–135 551.586:61

Wagner, Heinrich, **Einfluss föhnartiger Varhältnisse auf den Komplementgehalt bei Rheumatikern.** [Influence of föhn-like conditions on the complement-content (i.e., Bacteria-destroyin

ostance) in rheumatics.] *Angewandte Meteorologie*, 1(1):19–23, 1951. 2 figs., 3 refs. **DLC**—alyses of complement in blood serum (as an index of resistance) were made on rheumatic patients Bad Elster. These were compared with a "föhn value" equal to the interdiurnal change of nperature at 1 km minus $\frac{1}{2}$(2+3 km), which has a definite relation to weather. Positive values re associated with large or small complement content, negative values with average content. om variation in successive days author infers that föhn-like weather causes a stimulus which first reases complement, followed by a reversal. (*Same item as* 3.1–166, January 1952, *MAB.*) *bject Headings:* **1. Föhn effect on rheumatism 2. Rheumatism.**—*C.E.P.B.*

8K–136 551.586:612:551.547.3

Wagner, Heinrich, **Schwingungen im Verlauf der Körpertemperatur und ihre Kopplung mit nnartigen Verhältnissen.** [Oscillations in the course of body temperature and their relation to n-like conditions.] *Angewandte Meteorologie*, 1(7):193–202, Oct. **1952.** 6 figs., tables, 12 refs. **LC**—A comprehensive and well planned statistical analysis of 80,000 individual body temperature easurements carried out thrice daily on patients in tuberculosis sanitaria in southwest Saxony d on rheumatic patients in Bad Elster in order to determine whether weather influences body mperature. The existence of a statistically significant relationship between föhn-like weather d body temperature was established on the basis of 242 individual temperature curves. The e and fall in body temperature are analyzed in relation to changes of isobaric topography extending m 1000 to 96 mb whereby descending air currents are associated with föhn-like weather. Using e curve constructed from isoallobaric charts, the author shows statistically that the maximum hn values represent the critical point at which body temperatures attain their minimum value and nimum föhn values are associated with maximum body temperatures. (*Same item as* 4.4–259, pril 1953, *MAB.*) *Subject Heading:* **1. Föhn effects on body temperature.**—*I.L.D.*

8K–137 551.586:616

Wagner, H. and Jordan, H., **Synoptische Betrachtungen an Hand routinemässig ermittelter örpertemperaturen in 5 verschieden gelegenen Tbc-Heilstätten aus dem Gebiet der DDR.** [Synptic considerations of routine body temperature measurements in 5 differently situated tuberculosis spitals of East Germany.] *Angewandte Meteorologie*, Berlin, 2(6):169–176, Dec. **1955.** 4 figs., tables, 6 refs. **DLC**—The body temperature of 500 patients distributed evenly among five tuberlosis sanitaria were measured at synoptic hours over a period of two months and the daily diurnal riations of body temperature of each individual were examined. Significant decreases in body mperature were associated with a case of atmospheric pressure at the surface, a fall of vapor pressure d a fall of temperature up to the 500 mb level (approaching föhn); a rise of body temperature was sociated with opposite meteorological conditions. (*Same item as* 7.6–225, June 1956, *MAB.*) *ubject Headings:* **1. Föhn effects on body temperature 2. Tuberculosis.**—*C.E.P.B. & I.L.D.*

8K–138 551.586:616:551.556

†Warmbt, W., **Meteoropathologische Beobachtungen in Dresden bei Südsüdost-winden.** Meteoropathological observations in Dresden during SSE winds.] *Angewandte Meteorologie*, 8):244–255, Dec. **1952.** 8 figs., 4 tables, 34 refs. **DLC**—Persistent SSE winds at Dresden are rong squally katabatic currents ("jets") between Erzgebirge and Lausitz mountains, usually sociated with subsidence inversions of quasistationary anticyclones over Balkans; average duration hours. Their topographic cause and aerology are discussed; they resemble föhn winds. Their otropic effect is shown by the coincidence of gall colic and gallstone pains with greatest velocity SSE winds. The example of March 8–9, 1952, is discussed in detail. Following P. Courvoisier e biotropic effect is attributed, as with föhn, to subsonic pressure variations acting through the r. (*Same item as* 4.8–249, Aug. 1953, *MAB.*) *Subject Heading:* **1. Wind effects on gallstone tacks.**—*C.E.P.B.*

8K–139 551.586:616.917

Warmbt, W., **Zur meteorotropie des Scharlachs.** [On the meteorotropism of scarlet fever.] *ermany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 42:93–103, **1952.** 5 figs., 8 tables,) refs. **DWB**—Using the 2840 cases of scarlet fever which occurred in Dresden during the period n. 1949–April 1951, the author investigated statistically the relationship between large scale eather situations and the daily incidence of scarlet fever. Large scale weather situation is one hich is usually present for several days or even weeks. The endemic concentration of cases began ith a pronounced peak in July 1949 and in March 1950, These were the consequences of preceding nomalous weather conditions (wet cold June 1949 and mild and rainy Feb. 1950). The cases ccurring during the principal disease period (Sept.–March) and the corresponding large scale eather situations are analyzed statistically. It is shown that scarlet fever has a higher incidence uring weather situations characterized by cyclonic circulation (westerly situations). During eather situations with mixed circulation types (e.g. high pressure area over the Mediterranean)

there was a marked scattering of the daily occurrence of scarlet fever. The scattering exceeds in this case the chance. (*Same item as* 5.4–236, April 1954, *MAB.*) *Subject Headings:* **1. Weather effects on scarlet fever 2. Scarlet fever.**—*Trans. of author's summary* (*I.L.D.*)

8K–140 551.586:312.26

Wasmuht, Klaus, **Abhängikeit der Sterblichkeit bei Herzkrankheiten, Tuberkulose Apoplexie, Grippe und Embolie von Jahreszeit und Wetter.** [Dependence of mortality from heart diseases, tuberculosis, apoplexy, grippe and embolism upon season and weather.] *Virchows Archiv f. Pathologische Anatomie . . .*, Berlin, 303:138–153, **1938/1939.** 9 figs., 2 tables, refs. **DNLM**—Over a period of 7 years (1931–1937) mortality statistics for cardiac diseases, tuberculosis, grippe, apoplexy and embolism were collected at Halle and the hour and date of death were noted. Also, daily variations of temperature, atmospheric pressure and relative humidity were recorded. Also data on air masses and frontal passages were noted for the period 1935–1937. Cardiac diseases manifest a distinct mortality maximum in Feb. and minimum in June. Endocarditis deaths show a distinct summer maximum. Weather changes do not seem to cause death in cardiac diseases. Deaths from tuberculosis attain a maximum in May. Neither variations in atmospheric pressure, temperature and relative humidity appear to influence tubersulosis mortality. Cold air incursions in summer and warm air incursions in winter cause an accumulation of deaths from apoplexy. The annual variation of deaths from grippe shows a winter maximum. Deaths from embolism show no seasonal variation. Frontal passages appear to influence deaths from embolism while air pressure and temperature and relative humidity have no effect. *Subject Heading:* **1. Mortality due to weather**—*I.L.D.*

8K–141 551.586:616:551.515.8

Whiten, Alfred J., **Rheumatism and fronts.** *Weather*, 8(1):10–13, Jan. **1953.** table, 6 refs. **DWB**—Reports of rheumatic pains recorded at six hour intervals by several patients were analyzed in relation to six hourly records of all frontal passages and four periods before and after the frontal movements. No statistically significant relationships could be established between frontal passages and rheumatic pains. The suggestion is proposed that such pains are caused by the retention of excess of water by the body tissues caused by changes in atmospheric pressure. (*Same item as* 4.8–250, Aug. 1953, *MAB.*) *Subject Headings:* **1. Frontal effects on rheumatism 2. Rheumatism**—*I.L.D.*

8K–142 551.586:551.524:612.

†Winslow, Charles-Edward Amory and Merrington, L. P., **Temperature and human life.** Princeton, N. J., Princeton Univ. Press, **1949.** 272 p. 39 figs., tables, 151 refs. **DWB**—Based chiefly upon the work of the John B. Pierce Laboratory of Hygiene (Yale University), this book discusses the experimental and theoretical aspects of the physical and physiological basis of man's heat exchange with the ambient atmosphere. The author discusses the process of metabolism, the principal problems of thermal interchanges between the body and its environment, the mechanism by which it adapts itself to the environment, the air conditions of occupied spaces and the influences of climate and season upon health. (*Same item as* 4–139, April 1950, *MAB.*) *Subject Headings:* **1. Physiological heat balance 2. Temperature effect on health 3. Clothing requirements.**—*I.L.D.*

8K–143 551.586:616.

Wirth, Erich and Lauchheimer, Hans, **Meteorologische Unstetigkeitsschichten und "Erkältungs"-Krankheiten des Ohres und der oberen Luftwege.** [Meteorological instability layers and "colds" of the ear and upper respiratory passages.] *Acta Oto-laryngologica*, 19:304–322, **1933/1934.** 4 refs., fig., 3 tables. **DNLM**—The relationship between disease of the ear and of the upper respiratory passages caused by colds and weather instability phenomena was studied in 1926 ambulator patients during 1929 in Heidelberg University clinic. In all these cases it was possible to determin the day when the illness began. Also, all genuine and postoperative anginas that occurred durin the year were considered. The incidence of disease was studied in relation to vapor pressure, relativ humidity, air temperature, atmospheric pressure, cloudiness, precipitation and air mass movement The incidence of rhinitis and sinusitis, pharyngitis and laryngitis, genuine angina, postoperativ angina, otitis medie chronice, otitis externe, etc. to air mass and frontal passages was examinec A temporal relationship could be established between the passage of meteorological instabilities an diseases due to colds. But also such disease as diseases of the cerumen and otitis media whic most probably are not associated with weather instability also increased at the same time. Th author maintains that increase in the illness due to colds with the increased air mass alternation probably accidental. *Subject Heading:* **1. Weather effects on diseases of the ear.**—*I.L.D.*

8K–144 551.524.36:551.586:616.

Wright, G. Payling and Wright, Helen Payling, **Etiological factors in broncho-pneumonia amor infants in London.** *Journal of Hygiene*, Cambridge, 44:15–36, **1945/46.** 4 figs. **DLC**—Statisti

c the seasonal mortality from broncho-pneumonia over the period 1923–39 in the Metropolitan
roughs of London are analyzed to determine the relation of seasonal trend in death rate to air
nperature at various time intervals preceding death. The average daily mean temperature for
e coldest day of the week was correlated with mortality for various succeeding weekly periods.
ow external temperatures appear to be the most important predisposing cause of fatal broncho-
eumonia in infants; their weekly deaths rate from this disease in mid-winter is about seven times
t in the late summer. This great seasonal fluctuation in mortality is also found for persons over
years in the Administrative County; and for persons of all ages in both rural and urban counties
the Home Counties." The weekly mortalities of infants from broncho-pneumonia in the Ad-
nistrative County were most strikingly connected with low temperatures 2 weeks earlier. The
rtality rises sharply when the colder day week falls below 40°F. There is no indication that
er temperatures in the spring are more closely associated with death rate from broncho-pneumonia
n lower temperatures in the summer. (*Same item as* 5.8-144, August 1954, *MAB.*) *Subject*
adings: **1. Temperature effects on pneumonia mortality 2. Broncho-pneumonia mortality**
Infant mortality 4. London, Eng.—*I.L.D.*

8K–145 551.586:616.925

Wulff, Ferd, **Nogle epidemiologiske undersögelser over Börnelammelsen 1937 Köbenhavns**
tsraadskreds og paa Frederiksberg, (and) Petersen, Helge, **Nogle bemaerkninger om muligheden**
inflydelse af vejrforholdene paa forekomsten af poliomyelitis M.M. *Bibliotek för Laeger* **1938**:
7–344. 4 tables, 17 figs. [Some epidemiological investigations on infantile paralysis in 1937
he Copenhagen district and in Frederiksberg, (and) Peterson, Helge, Some remarks on the possible
uence of weather upon the occurrence of infantile paralysis.] **DNLM**—Comparing the fre-
ncies of different forms of poliomyelitis which occurred during the 1934 and 1937 epidemics in
Copenhagen district, the authors found a significant increase in the number of paralytic cases in
34 (71 in 1934 and 97 in 1937). An analysis was made of the relationship between the frequency
nfantile paralysis during Aug., Sept. and Oct. and mean monthly air temperature, mean monthly
cipitation and mean monthly sunshine duration. Each year from 1909 to 1937 was examined
Copenhagen. The author maintains that a relationship exists between poliomyelitis incidence
h solar altitude rather than with temperature or precipitation. Data from Denmark, the United
tes of America and New Zealand indicate that the incidence of poliomyelitis to the annual varia-
ns is the amount of solar illumination or solar elevation. *Subject Headings:* **1. Weather effects on**
iomyelitis 2. Poliomyelitis.—*I.L.D.*

8K–146 551.586:616.12:519.2

Zink, Otto, **Über die Beeinflussung der Hypertonie und Herzinsuffizienz durch Wetterfaktoren.**
he effect of weather factors on hypertension and cardiac insufficiency.] *Annalen der Meteorologie,*
dizin-Meteorologische Hefte, No. 8:95–98, **1953.** 3 tables. **DWB**—The effect of weather upon
ividuals suffering from hypertension and cardiac insufficiency is examined on the basis of 2166
es of hypertension and 1179 cases of cardiac insufficiency recorded in Hamburg in 1951. The
cedure involved dividing each day into four 6-hour intervals recording the evidence of various
ical symptoms manifested in the cases of hypertension and cardiac insufficiency during the various
rnal divisions, and classifying the individual days into four groups on the basis of the number of
ical symptoms recorded per day. The different possibilities of combinations between the diurnal
dence of clinical symptoms for the two types of disease amounts to 16 classes which are correlated
h four types of weather situations, namely: (1) upglide and equivalent temperature below 50°C;
upglide and equivalent temperature above 50°C; (3) no upglide and equivalent temperature
w 50°C; (4) no upglide and equivalent temperature above 50°C. Correlation coefficients and
-square tests show a weak correlation between diurnal reactions and specified weather conditions.
me item as 4.8–252, Aug. 1953, *MAB.*) *Subject Headings:* **1. Weather effects on heart disease**
Heart disease.—*I.L.D.*

8K–147 551.586:612

Zwecker, A., **Über die Abhängigkeit des Erythema exsudativum multiforme von atmosphäri-**
en Einflüssen. [Dependence of erythema exsudativum multiforme upon atmospheric influences.]
hiv für Dermatologie und Syphilis, 161:366–378, **1931,** 7 figs., ref. **DNLM**—After reviewing
umber of statistical studies on the annual variations in the incidence of erythema exsudativum
ltiforme, the author examines all cases of this illness which occurred during the period 1919–1929
he University of Heidelberg skin clinic. The auther found that this disease depends upon light
nsity. The injurious light effect is associated with a mean monthly temperature of 7–15°C,
not above 16–28°C; it also declines below 7°C. Low atmospheric relative humidity increases
frequency of incidence. In months with approximately similar monthly mean temperatures
different degrees of relative humidity the dry months have a higher incidence of erythema
dativum multiforme than the humid months. *Subject Heading:* **1. Weather effects on skin**
ases.—*I.L.D.*

SUPPLEMENTARY MATERIAL

8K–148 551.586:61

†*De Rudder, Bernhard (*Dir. Univ. Kinderklinik, Frankfurt a.M.*), **Grundriss einer Meteorolo-biologie des Menschen. Wetter- und Jahreszeiteneinflüsse.** [Outline of a meteorobiology of man Weather and seasonal influences.] Berlin, Springer, **1952.** 3rd ed. 303 p. 56 figs., 30 tables bibliog. p. 268–296. **DWB**—A systematic treatise on the physiological and pathological influence exerted on human beings by weather processes and seasons. The methodology underlying th scientific study of meteorological phenomena in man is discussed; a brief account of air masses cyclonic processes in the atmosphere, occlusion processes, föhn and inversions is given; and th application of simple statistical techniques for testing correlation significance and degree of ran domness is illustrated. The rest of the book comprises: 1) a detailed survey of the literature on th reactions to weather as revealed by such diseases as eclampsia, circulatory and heart diseases, croup etc.; the physiological effects of cyclones, inversions, föhn winds, of ozone and atmospheric electricity 2) the relationships between season and the manifestation and frequency of disease and 3) meteoro logical prophylaxis. (*Same item as* 4.8–7, Aug. 1953, *MAB.*) *Subject Headings:* **1. Meteorobiolog 2. Medical meteorology.**—*I.L.D.*

PART III. REVIEWS, TRANSLATIONS, REPRINTS, ROUTINE PUBLICATIONS, AND ANALYTICS FROM RECENT SERIALS AND COLLECTED WORKS

Note: Material listed in these sections will not be included in the monthly indexes until abstracted. The item number is mentioned for those titles which have been abstracted in previous issues of **Meteorological Abstracts and Bibliography.**

A. REVIEWS OF IMPORTANT METEOROLOGICAL MATERIAL

Livshits, G. Sh.: **Iarkost' bezoblachnogo neba pri snegovom pokrove** [Brightness of a cloudless sky in the presence of a snow cover]. Dissertation summarized by F. A. Kirillov in *Akademiia Nauk SSR, Izvestiia, Ser. Geofiz.*, No. 7:878, July 1956.

Weis, Bernhard: **Fortschritte in der meteorologischen Forschung seit 1900** [Progress in meteorological research since 1900]. Frankfurt a.M., Akademische Verlagsgesellschaft, 1956. 238 p. figs., ports, tables, eqs., bibliogs. Review by C. E. P. Brooks in *Royal Meteorological Society, Quarterly Journal*, 38(356):282, April 1957. (*For review on original, see* 8.8–17, Aug. 1957, *MAB*)

Öpik, E. J.: **Meteor excitation, ionization, and atomic luminous efficiency.** (In) *Royal Society of London, Proceedings, Ser. A*, 230(1183):463–501, July 12, 1955. 32 tables, 33 refs., 38 eqs. Summary in Kaiser, T. R., ed., **Meteors.** pub. London, Pergamon Press, 1955. p. 29–32. table, 12 refs., 2 eqs. (*See* 7.2–275, Feb. 1956, *MAB*)

Riazanov, Vladimir A.: **Sanitarnaia okhrana atmosfernogo vozdukha** [Sanitary protection of the air]. Moscow, Gos. Izdat. Meditsinskoĭ Literatury, 1955. 235 p. 20 figs., 52 tables, bibliog. p. 221–231. Review by M. S. Gol'dberg in *Gigiena i Sanitariia*, Moscow, 21(9):59–60, Sept. 1956. (*See* 8.3–26, March 1957, *MAB*)

Riehl, Herbert: **Tropical meteorology.** N. Y. McGraw-Hill, 1954. 392 p. tables, numerous figs., extensive bibliogs. Review by J. L. Galloway in *World Meteorological Organization, WMO Bulletin*, 3(4):156–158, Oct. 1954. (*See* 5.8–8, Aug. 1954, *MAB*)

Rounds, Wellington, Jr.: **Solutions of two-dimensional diffusion equations.** (In) *American Geophysical Union, Transactions*, 36(3):395–405, June 1955. 7 figs., 4 refs., 48 eqs. Summary in U. S. Dugway Proving Ground, **Symposium on Micrometeorology Turbulent Diffusion, June 28–29, 1954.** pub. 1956. p. 48. (*See* 7.4–139, April 1956, *MAB*)

Schmidt, F. H.: **Meridional heat transport and subtropical jet stream** (*summary only in*) *Pacific Science Congress, 8th, Quezon City, Philippines, Nov. 1953, Proceedings*, Vol. IIA, pub. 1956. p. 979–980. eqs.

Thornthwaite, C. W. et al.: **Recent studies in bioclimatology.** *Meteorological Monographs* (pub. by American Meteorological Society), Vol. 2, No. 8, 1954. 121 p. Review by W. Mörikofer in *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 7(3/4):383–485, 1956. (*See* 6B–206, Feb. 1955, *MAB*)

U. S. School of Aviation Medicine, Randolph Field, Texas: **Physics and medicine of the upper atmosphere: a study of the aeropause (Proceedings of a symposium, San Antonio, Texas, Nov. 6–9, 1951).** Ed. by Clayton S. White and O. O. Benson, Jr. Albuquerque, Univ. of New Mexico Press, 1952. 611 p. 150 figs., tables, 46 plates, refs. Review by Harvey E. Savely in *Air University Quarterly Review*, 6(2):117–120, Summer 1953. (*See* 3.11–11, Nov. 1952, *MAB*)

Vaeth, Joseph Gordon: **200 miles up: the conquest of the upper air.** 2d ed. rev. N. Y., Ronald Press, 1955. 261 p. illus. Review by R. M. Goody in *Royal Meteorological Society, Quarterly Journal*, 83(355):138–139, Jan. 1957. Review by J. J. Kelly in *American Meteorological Society, Bulletin*, 38(5):307–308, May 1957. (*See* 8.6–12, June 1957, *MAB*)

Viaut, André: **La météorologie du navigant** [Meteorology for the navigator]. Paris, Blondel la Rougery, 1956. 284 p. 134 figs., 29 plates, 12 tables, 7 charts. Review by J. R. Rivet in *World Meteorological Organization, WMO Bulletin*, 6(3):123, July 1957. (*For abstract on 1949 ed., see* 3–9, March 1950, *MAB*)

Watts, Ian E. M.: **Equatorial weather with particular reference to Southeast Asia.** London, Univ. of London Press, 1955. 223 p. 129 figs., tables, 78 refs. Review by A. G. Forsdyke in *Meteorological Magazine*, London, 86(1015):26–27, Jan. 1957. Review by L. C. W. Bonacina in *Geographical Journal*, London, 123(1):107, March 1957. (*See* 7.4–10, April 1956, *MAB*)

White, Gilbert F., ed.: **The future of arid lands: papers and recommendations from the International Arid Lands Meetings, Albuquerque, N. Mexico, 1955.** *American Association for the Advancement of Science, Wash., D. C., Publication*, No. 43, 1956. 464 p. 49 figs., numerous bibliogs. Review by Thomas Maddock, Jr., in *Science*, Wash., D. C., 125(3248):606–607, March 28, 1957. Review in *Scientific American*, N. Y., 197(3):262–263, Sept. 1957. (*See* 8.4–5, April 1957, *MAB*)

Zamorskiĭ, A. D.: **Atmosfernyĭ led, ineĭ, gololed, sneg i grad** [Atmospheric ice, hoar-frost, glaze, snow and hail]. Moscow, Akademiia Nauk SSSR, 1955. 377 p. 79 tables, 172 figs. Review by V. A. Dzhordzhio in *Meteorologiia i Gidrologiia*, No. 2: 60–61, Feb. 1957. (*See* 7.11–12, Nov. 1956, *MAB*)

B. TRANSLATIONS, REPRINTS, AND ROUTINE PUBLICATIONS

Translations

Abramova, M. M.; Bol'shakov, A. F.; Oreshkina, N. S. and Rode, A. A.: **Isparenie iz pochvy podveshennoĭ vlagi** [Evaporation of suspended water from the soil]. *Pochvovedenie*, Moscow, No. 2:27–41, 1956. 9 figs., table, 9 refs. Trans. into English available Commonwealth Scientific and Industrial Research Organization (CSIRO) Information Service, 213 Albert St., E. Melbourne C., 2, Victoria, Australia.

Beelitz, Paul: **Radiosonden** [Radiosondes]. Berlin, VEB Verlag Technik, 1954. 136 p. numerous figs. (incl. photos), 19 tables, 85 refs., 21 eqs. Trans. into English of p. 69–79 available for reference, U. S. Weather Bureau Library (MO8.812 B414me). 10 p. 11 figs., 10 refs. (*For abstract on original, see* 7.1–8, Jan. 1956, *MAB*)

Berezkin, Vs. A.: **Poteplenie v Arktike i usilenie tsirkuliatsii vod Poliarnogo basseĭna** [Warming in the Arctic and increased circulation of the waters of the Polar Basin]. *Morskoĭ Sbornik*, Leningrad, 20(4):105–132, April 1937. 13 figs., 7 tables, refs. Trans. into English available U. S. W. B. (M85.1 B487w). 39 p. figs., etc. (*See* 5I–62, Sept. 1954, *MAB*)

Burkhanov, Vasiliĭ Fedorovich: **Novye sovetskie issledovaniia v Arktike** [New Soviet research in the Arctic]. Moscow, Gos. Izd-vo Geogr. Litry, 1955. 51 p. illus., maps. English trans with title: **New research of Soviet scientists in the Arctic,** with imprint, Moscow, Znanie Pub. House, 1955. Available, National Research Council, Library, Ottawa, 2, Canada, as its NRC-2289.

Drimmel, J.: **Der Frostschutz durch Lufttrübung—rechnerisch betrachtet** [Frost protection by smoke screening, theoretically considered]. *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 6(4):443–451, 1955. 3 figs., table, 19 refs. English and French summaries p. 443–444. Trans. into English available as CSIRO-3338.

Felitsyn, F. N.: **Protuberantsy i geomagnitnaia aktivnost'** [Prominences and geomagnetic activity]. *Astronomicheskiĭ Zhurnal*, Moscow, 17(6):21–25, 1940. 2 figs., 2 tables, 6 refs. English summary p. 25. Trans. into English by E. R. Hope. Issued as *Canada. Defence Research Board, Translation* T-195-R, March 5, 1956. Available DWB.

Grabovskiĭ, M. A. and Petrova, G. N.: **Ob ustoĭchivosti ostatochnogo namagnicheniia gornykh porod** [Stability of remanent magnetization of rocks]. *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 3:290–206, 1956. 5 figs., 10 refs., eqs. Trans. into English available from Associated Technical Services, P.O. Box 271, East Orange, N. J. as its 56J14R.

Hoffmeister, C.: **Die atmosphärisch-optische Störung vom Jahre 1953 (Ergebnisse der Beobachtungen in Südwestafrika 1952–1953, Vierte Mitteilung)** [Atmospheric-optical disturbance of 1953: results of observations in S.W. Africa, 1952/1953, Pt. 4]. *Zeitschrift für Meteorologie*, Berlin, 10(3):76–86, March 1956. 4 figs., tables, 21 refs. Trans. into English available as CSIRO 3335. (*See* 7.11–297, Nov. 1956, *MAB*)

Iudalevich, F. F.: **O mnogokratnom rasseianii v infrakrasnoĭ oblasti spektra** [Multiple scattering in the infrared region of the spectrum]. *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 7:862–864, July 1956. 3 tables, 4 refs., 4 eqs. Trans. into English by E. R. Hope issued as *Canada. Defence Research Board, Translation* T-239-R, Jan. 1957. 3 p. Available DWB.

Khromov, S. P.: **Geograficheskoe rasprostranenie mussonov** [Geographical distribution of monsoons]. *Vsesoiuznoe Geograficheskoe Obshchestvo, Leningrad, Izvestiia*, 89(1):7–13, Jan./Feb. 1957. fig., 14 refs. Trans. into German in *Petermanns Geographische Mitteilungen*, 101(3):234–237, 1957.

Krat, V. A. and Krat, T. V.: **O konturakh spektral'nykh linii solnechnoĭ khromosfery** [Spectral-line profiles of the solar chromosphere]. *Pulkovo. Glavnaia Astronomicheskaia Observatoriia, Izvestiia*, 19(6):1–30, 1955. 16 figs., 15 refs., 17 eqs. Trans. into English by Bronislas de L. Jezierski and David Kraus. Issued by American Meteorological Society under Contract AF 19(604)-1936, Feb. 1957. 55 p.

Leningrad. Gosudarstvennyĭ Gidrologicheskiĭ Institut: **Atlas tipovykh proektov gidrometricheskikh sooruzhenii, Chast' I** [Atlas of typical plans of hydrometric installations, Pt. 1]. "Prepared by A. R. Skue, N. A. Zvorykina and Z. N. Puzyrevskaia. General supervision and editing by V. V. Ukhanov." Leningrad, Gidrometizdat, 1952. 44 folios of drawings and a brief explanatory text. Review by V. A. Berg in *Meteorologiia i Gidrologiia*, Leningrad, No. 11:52–54, Nov. 1956. Trans. of text of review into English, available DWB (532.5 B493be).

Lettau, Heinz: **Synthetische Klimatologie** [Synthetic climatology]. *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:127–316, 1952. 4 figs., 3 tables, 8 refs., 50 eqs. German and English summaries. Trans. into English by James Gough, Jr. Issued by American Meteorological Society under Contract AF 19(604)-1936, April 30, 1952; rev. June 1957. 37 p. 4 figs., etc. (*See* 4.2–101, Feb. 1953, *MAB*)

Magiwara, Sekijo and Kobayashi, Teisaku: **On the growth of water droplets around hygroscopic particles in convective cloud and its application to artificial rainmaking.** *Low Temperature Science, Japan, Ser. A, Physical Sciences*, Sapporo, 12:94–111, 1954. 10 figs., 5 tables, 11 refs. In Japanese; English summary p. 112. Trans. into English issued by Special Libraries Association, Translation Center (John Crerar Library, Chicago), as its 57-3067. 22 p. (*For abstract on English language version, see* 6J–255, Oct. 1955, *MAB*)

Reprints

Crease, J.: **Long waves on a rotating earth in the presence of a semi-infinite barrier.** *National Institute of Oceanography, Wormley, Collected Reprints*, 4(145), 1956. 12 p. 4 figs., 12 refs., 33 eqs. (*For abstract on this paper from another source, see* 8.2–34, Feb. 1957, *MAB*)

Hirose, M.; Okuta, M. and Asakura, T.: **On the relationship of 5-day mean 700-mb anomaly pattern to amount of precipitation (Studies on a seasonal weather forecasting, V, c).** *Papers in Meteorology and Geophysics*, Tokyo, 6(3/4):228–233, Jan. 1956. 2 figs., 4 tables, 3 refs. (*See* 8E–14, May 1957, *MAB*)

Klein, William H.: **Principal tracks and mean frequencies of cyclones and anti-cyclones in the Northern Hemisphere.** *U. S. Weather Bureau, Research Paper*, No. 40, 1957. 60 p. 28 figs., 72 charts, 130 refs. (*See* 8.9–29, Sept. 1957, *MAB*)

Kuo, Hsiao-Lan: **Studies of forced and free symmetric convection in a rotating fluid with application to the atmosphere.** Massachusetts Institute of Technology, Dept. of Meteorology, Contract AF 19(604)-1000, Scientific Report, No. 3, Feb. 29, 1956. 35 p. 3 figs., 17 refs., 50 eqs. (*See* 8.4–174, April 1957, *MAB*)

Yamasaki, Fumio and Kaneko, Hideko: **On the artificial radioactivity in rain water observed in Tokyo from April to December 1954.** (In) Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb.** pub. Tokyo, 1956. Vol. 1:255–262. 6 figs., table, 3 refs., eqs. (*See* 7E–186, May 1956, *MAB*)

Routine Publications

British Columbia. Dept. of Agriculture: **Climate of British Columbia: tables of temperature, precipitation, and sunshine, 1955.** pub. Victoria, B.C., 1956. 39 p. Almost entirely tables. (*See* 3.4–44 April 1952, *MAB, for abstract on 1949 issue*)

French Somaliland. Service Météorologique: **Résumé mensuel du temps** [Monthly weather review], Nov.–Dec. 1954. Issued Djibouti, 1955? 2 pieces, unpaged, about 10 p. each. Mostly tables.

India. Meteorological Dept.: **India Weather Review 1949, Annual Summary, Pt. A, Summary of weather with tables,** pub. 1955. 155 p. Almost entirely tables. (*See* 6.3–42, March 1955, *MAB for 1948 issue*)

India. Meteorological Dept.: **India Weather Review, 1951, Annual Summary, Pt. C, Storms and depressions.** pub. Delhi, 1955. 11 p. 13 tables, fig., 2 charts. Appended, List of publications of the India Met. Dept. as of Jan. 1955, including publications now out of print. (*See* 4.3–41, March 1953, *MAB for 1945 issue*)

India. Meteorological Dept.: **Magnetic, meteorological, atmospheric electric and seismographic observations made at the Government Observatories Bombay and Alibag, (Vol. 62), 1950.** pub. Delhi, 1955. Each section repaged. 5 plates. Almost entirely tables.

Luxembourg. Service Météorologique et Hydrographique: **Annuaire Météorologique et Hydrographique** [Meteorological and hydrographical annual], 1953. pub. 1954. 150 p. Map. Almost entirely tables. (*See* 3.7–47, July 1952, *MAB for 1951 issue*)

Madeira. Serviço Meteorológico: **Boletím Mensal das Observacões Meteorologicas no Arquipelago da Madeira** [Monthly bulletin of meteorological observations in the Madeira Islands], Vol. 12. No. 2, Feb. 1956. Issued Funchal, Madeira. 4 p.

Modena. Università. Osservatorio Geofisico: **Osservazioni Meteorologiche** [Meteorological observations], 1954. Its *Pubblicazioni*, No. 62, pub. 1955. 31 p. Mostly tables. (*See* 6.10–73, Oct. 1955, *MAB for 1953 issue*)

C. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Akademiia Nauk SSSR. Geofizicheskiĭ Institut, Trudy, No. 37(164), 1956

Gutman, L. N.: **K teorii rascheta temperatury pochvy,** [Theory underlying soil temperature calculations], p. 3–49

Sarkisian, A. S.: **K voprosu ob opredelenii statsionarnykh vetrovykh techeniĭ v baroklinnom sloe okeana,** [Determination of stationary wind currents in a baroclinic layer of the ocean], p. 50–61

Feĭgel'son, E. M.: **Vliianie oblakov na teplovoĭ rezhim atmosfery,** [Influence of clouds on the thermal regime of the atmosphere], p. 62–88

Malkevich, M. S.: **Vykholazhivanie atmosfery pod vliianiem luchistogo teploobmena,** [Cooling of the atmosphere under the influence of radiative heat exchange], p. 89–101

Malkevich, M. S.: **Izmeneniia temperatury vozdukha so vremenem pod vliianiem turbulentnogo peremeshivaniia i luchistogo teploobmena,** [Temporal temperature variations under the influence of turbulent mixing and radiative heat exchange], p. 102–119

Malkevich, M. S.: **Teoreticheskiĭ raschet solnechnoĭ radiatsii pogloshchaemoĭ atmosferoĭ za raznye promezhutki vremeni,** [Theoretical calculation of solar radiation absorbed by the atmosphere at various time intervals], p. 120–131

Kogan, S. Ia.: **O metode rascheta advektivnogo pritoka tepla,** [A method of calculating the advective heat influx], p. 132–141

Akademiia Nauk Uzbekskoĭ SSR. Institut Matematiki i Mekhaniki, Meteorologiia i gidrologiia v Uzbekistane, [Meteorology and hydrology in Uzbekistan]. Tashkent, pub. by the Akademiia, 1955.

Iaroslavtsev, I. N.: **Rezul'taty ucheta solnechnoĭ energii v Uzbekistane,** [Results of calculations of solar energy in Uzbekistan], p. 5–10

Lopukhin, E. A.: **Izmenenie potokov izlucheniia v atmosfere nad Tashkentom pri iasnom nebe,** [Variations of the radiation flux in the atmosphere over Tashkent on cloudless days], p. 11–21

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Molchanov, L. A.: **Novaia karta ispariaemosti na territorii Sredneĭ Azii,** [New evaporation map for the territory of Central Asia], p. 35–39

Semenova, O. A.: **O nekotorykh anomaliiakh osadkov v Sredneĭ Azii,** [Precipitation anomalies in Central Asia], p. 41–42

Morozova, M. I.: **Rol' fenovogo effekta gorno-dolinnoĭ tsirkuliatsii v formirovanii temperaturnogo rezhima Angrenskoĭ doliny,** [The role of föhn effect of the mountain-valley circulation in the formation of the thermal regime of the Angrena Valley], p. 43–49

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Zuev, M. V.: **O formirovanii mikroklimata khlopkovogo polia,** [Formation of the microclimate of a cotton field], p. 71–78

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Kozik, S. M.: **Lunnye zatmeniia i zemnaia atmosfera,** [Lunar eclipses and the earth's atmosphere], p. 85–88

Arifkhanova, M.: **O russko-uzbekskom slovare meteorologicheskikh terminov,** [Russian-Uzbek dictionary of meteorological terms], p. 89–91

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Dzhordzhio, V. A.: **Zadachi sinopticheskikh issledovaniĭ v Sredneĭ Azii,** [Problems of synoptic investigation in Central Asia], p. 103–110

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Tilliashaĭkhova, R.: **O primenenii nekotorykh teorem sokhraneniia k izucheniiu fiziki atmosfery,** [Application of certain conservation theorems to the study of atmospheric physics], p. 121–125

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Petrosiants, M. A. and Chernysheva, O. N.: **Termobaricheskie polia intensivnykh oblasteĭ izmeneniia davleniia, Chast' 1,** [Thermobaric fields in areas of intense pressure variations, Pt. 1], p. 133–150

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Alaskan Science Conference, 3rd, Mt. McKinley National Park, Sept. 22–27, 1952, Proceedings: Science in Alaska. Pub. College, Alaska, Sept. 1954

Petrie, W.: **Rotational temperatures of auroral nitrogen bands** (*abstract*), p. 32 (*For abstract on original, see* 7.3–294, March 1956, *MAB*)

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olloque International d'Astrophysique, 7th, Liège, July 12–14, 1956, Les molécules dans les astres, [Molecules in the stars], issued as *Société Royale des Sciences de Liège, Mémoires,* Ser. 4, Vol. 18, 1957

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